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ENTITLED

THE DUMPING GROUND OF NEURASTHENIA.

Delivered before the West Kent Medico-Chirurgical Society on Dec. 13th, 1929.

BY SIR E. FARQUHAR BUZZARD, BT., K.C.V.O., M.D. OXON., F.R.C.P. LOND.,

CONSULTING PHYSICIAN TO ST. THOMAS'S HOSPITAL; REGIUS PROFESSOR OF MEDICINE IN THE UNIVERSITY OF OXFORD.

TAKEN as a whole we doctors carry on our trade in an honourable fashion and are imbued with a genuine desire to cheat neither our clients nor ourselves; but it can hardly be denied that the label of neurasthenia is often used in order to evade a duty—the duty imposed on us to declare a correct diagnosis. Whether such action should be regarded as a crime or only as a pardonable misdemeanour is a moral question I do not propose to discuss; the object of my discourse is to show that it is not good business.

The label of neurasthenia is a bad business proposition for two reasons. In the first place it conveys little or no pathological meaning to your own mind; in the second place it gives your patient the impression that he is suffering from a disease the cause, course, and outcome of which are equally mysterious to both of you. "Then, it is only nerves?" he will say to you. And you won't know what answer to give. Whether it is yes or no or a compromise, it is given with a hesitancy which can only add to the patient's depression and must eventually lead to loss of confidence. And that is bad business because, contrary to what is generally supposed and to what might be expected, we are not really judged so much by the results of our treatment, which is fortunate, but by our knowledge and understanding of our patients and their illnesses. The quack must perforce depend on his ability to cure and, therefore, always and inevitably fails in the long run to keep the position he attains by means of a wealth of promise and a poverty of knowledge. *We* must rely on our ability to detect the origin of an illness, on our acquaintance with its natural progress and natural result, and on our experience of how these may be influenced by treatment, if we are to preserve our rôle of trusted guide, rather than that of healer, in times of trouble. This is an axiom which holds good in all fields of medicine, but which has peculiar difficulties as well as outstanding importance in its application to the handling of neuroses or functional nervous disorders.

It is to these difficulties and the mode of their origin that attention must be drawn if an attempt to tidy up the dumping-ground of neurasthenia is to meet with any success.

NATURE OF FUNCTIONAL DISORDERS.

Thirty years ago those interested in disorders of the nervous system were chiefly concerned with the study of structural changes as revealed in the human body after death, and with the determination of physical signs denoting the presence of such structural changes during life. Disorders of the nervous system at that time were either organic or functional, and in order to decide to which category a particular disorder belonged it was only considered necessary to determine the presence or absence of organic signs. In the absence of organic signs the condition was regarded as functional, and little further interest was taken in its pathology. The literature of the period I refer to is full of dissertations on the value of various signs of organic disease revealed during the examination of patients, especially in relation to the reflexes, and the work which was carried out was of great and lasting importance. Since that time, however, considerable advances have been made in neurology, in psychopathology, in endocrinology, in bacteriology, and in other branches of medicine, many of which bear upon the *nature* of functional nervous disorders and therefore upon their treatment.

In neurology, for instance, we are no longer altogether dependent on the presence of physical signs for a diagnosis of organic disease. We recognise disorders of function, as revealed by a patient's complaints, as equally good evidence of organic disease, and we rely therefore on our ability to discriminate between symptoms which suggest organic disease and those which suggest disorders of mind, using that term in preference to that of "functional disorders." For this purpose we are obliged to pay much attention and give much time to the histories of patients and to cultivate the arts of listening and of cross-examination. In other words, we have come to study illnesses in longitudinal section more than in cross-section as was the custom at an earlier period. The same trend has been manifest in the domain of psychopathology where Freud, using the historical or longitudinal method of investigation, has led the way in exposing the source and development of many disorders of the mind, thus throwing much-needed light on the causal factors underlying the neuroses and psychoneuroses. Although we may not be ready to support the Freudian school in all its contentions and conclusions, there can be no doubt that we owe it a great debt of gratitude for clearing up many obscurities, and not least, and this as you will see has much bearing on my subject for to-night, for enabling us to distinguish between those mental disorders which are amenable to psychotherapy and those which are not. The importance of this step in dealing with the group of cases labelled "neurasthenia" is difficult to exaggerate.

As a natural corollary to what is sometimes termed the new psychopathology the physician can no longer be content with a diagnosis of functional disorder based on the absence of signs or symptoms of organic disease. He must go further, as he would in a case of organic disease, and endeavour to establish its pathology: in other words, to trace the morbid process back to its causal origin. That this quest is often difficult and sometimes unsuccessful, as in organic disease, does not absolve him from its pursuit, and, whatever the result, the process is likely to promote that favourable atmosphere of confidence between doctor and patient so essential for any therapeutic measures that may follow.

CLINICAL LIMITATIONS OF BIOCHEMISTRY.

Although it cannot be doubted that the obscurity of neurasthenic problems has been lightened by the advances in neurology and psychopathology I have referred to, the same cannot be stated with equal truth in regard to other branches of medicine such as endocrinology and bacteriology. On the contrary, Freudian doctrines have produced a reaction in the minds of many medical men which has taken the form of a desire to ascribe all mental disorders, including neurasthenia, to some physical or chemical agent the result of disturbed glandular secretions, of septic tonsils or teeth, of intestinal stasis or infection, or of a blood pressure which is too high or too low. In accepting such theories the post hoc propter hoc argument has been utilised with little critical judgment and the frequency with which all these morbid conditions are found unassociated with mental disorders has not been given sufficient weight. On the other hand, it has been often demonstrated that when the removal of teeth, tonsils, or an appendix has failed to cure an anxiety neurosis an attack on the position through psychological channels has brought complete and lasting relief. While it is the duty of a doctor in attendance on a neurasthenic patient to look after his or her physical health, he is guilty of culpable negligence if he overlooks or ignores the mental factors to which the patient's miserable condition is primarily due. This is a subject on which it is difficult

to speak in restrained language if one has often met, as I have, with patients suffering from anxiety neuroses, whose minds have been left unexplored and whose blood, secretions, and excretions have been subjected to an analysis resulting in pages of tabulated and incredible decimal fractions. Even a healthy individual has sufficient anxieties in life without the knowledge that his blood has a bicarbonate reserve of 70 c.cm. per cent., a sedimentation velocity of 3·65, and a serum viscosity of 1·875, or that his pulse-rate is 90 after ocular compression in the lying position!

The intimate functional relationship between the nervous system and the ductless glands and the circulatory and digestive systems may not be yet fully understood, but surely the youngest disciple of medicine realises that mental and emotional disturbances are capable of producing physical and chemical changes in the body ranging widely from the normal. In an overburdened medical curriculum there may yet be found room for a student to spend three months in acquiring a due sense of proportion and a lively sense of the ridiculous.

Two Distinct Groups.

So far I have spent my time in reconnoitring and preparing the ground for my attack on the dump of neurasthenia. Before going over the top I must launch a barrage, the shells of which contain my justification for the attack.

My first and principal plea is founded on the fact that out of any 100 patients sent or brought to me suffering from depression, insomnia, loss of concentration, and fatiguability, 99 are labelled neurasthenia or neurosis, and perhaps one a possible manic-depressive psychosis. After investigation the proportion is probably fifty-fifty. If you say that it does not matter much what you call them I would agree, provided only that you recognise that the two conditions are fundamentally different and require entirely different treatment. This knowledge is of paramount importance for the sake of the patient and equally important for the doctor's reputation, hence my reason for describing the matter as a business proposition.

Perhaps one of the chief obstacles to a general recognition of the frequency of the manic-depressive psychosis has been its unfortunate name with its asylum associations. Alternative terms such as primary, autonomous, or endogenous depression, in contrast to the depression of the anxiety state which may be regarded as secondary, reactive, or exogenous, are certainly preferable, and it is to be hoped that they may become more generally used.

Henceforward I shall use the term autonomous depression for describing these cases in the dump of neurasthenia, acknowledging at the same time that more severe examples of the same disease are commonly certified and frequently found in mental hospitals. It is essential to recognise that this mental disorder is met with constantly in everyday practice and that it presents every degree of severity from the individual who alternates between bouts of cheerfulness and activity on the one hand and periods of moodiness and inertia on the other, to the individual who is certified as suffering from mania or melancholia. With the latter I am not concerned to-night and they are not included in the dump. Without further preliminaries let me now launch my direct attack, and for this purpose I will utilise a very familiar experience.

I am confronted with a patient labelled neurasthenia. He is a business man, 38 years of age, and he is said to be suffering from the effects of overwork. He complains of depression, insomnia, inability to concentrate or make decisions, of headache, constant fatigue, indigestion, constipation, and loss of appetite. By careful examination I satisfy myself that he presents no signs of organic disease and come to the conclusion that I am faced with the duty of making a diagnosis either of an anxiety neurosis or of an autonomous depression, bearing in mind that these two conditions are far the commonest met with although some others cannot be excluded straight away.

In order to arrive at a diagnosis, which may be easy or difficult, I must now encourage the patient to talk over his story in detail, prompting him from time to time with such questions as appear to be necessary and perhaps supplementing his answers by an interview with his wife.

An Anxiety State.

Let me describe first of all the kind of story which leads me to diagnose an anxiety state. He is a man of good average intelligence and has prospered in his business. He is described as highly strung and liable to worry over little things and to be fussy about his health. He has never had an actual breakdown but has on several occasions been away from his work for short periods owing to slight attacks of "flu" or of nervous exhaustion. For some weeks he has been irritable, sleeping badly, complaining of a feeling of pressure on the top of his head, and a tight band round his temples. He has been eating less, as food gives him indigestion, and he has been trying numerous remedies for this and for constipation. His depression varies and may disappear temporarily when exposed to cheerful surroundings or when he has had a good night. When questioned as to the cause of his depression he says that he has had bad luck in his business, he has had too much thrown on his shoulders, and, anyhow, "anyone would be depressed feeling as ill as I do." His wife tells me that he has expressed fears about going out of his mind or that he may have a tumour on the brain. Pressed for any reason she could give for his breaking down, she confesses that he has had a row with an uncongenial partner but did not want it mentioned. There is no history of insanity in his family but he comes of "nervy" stock.

Autonomous Depression.

On the other hand, the story given in detail by the patient may present quite different features, in spite of the general similarity of complaints, and leads to the diagnosis of manic-depressive or autonomous depression.

He has always been a man of more than average ability and unusual energy. His health has been robust and it has never occupied his attention. Questioned about his depression he finds difficulty in describing it—a cloud has come down over him—things are unreal—nothing interests him—he has always been fond of his wife and children but he feels now he has no affection for them. He has no relish for food or for tobacco. Life is not worth living and he is no use to anybody and never will be. As to the cause, he does not believe it is overwork; he always loved his work and revelled in it. Now he cannot make up his mind about anything and if he does he always regrets it, as he is convinced that he has made the wrong decision. He believes that he has brought the whole thing on himself by reason of a sexual indiscretion dating back some 15 years. Pressed as to the occurrence of any illness of the same kind in the past after some hesitation he recalls a similar cloud coming down over him when he was 21, but it lifted in a week and he has never thought about it since. It was ascribed to overwork for an examination. His sleep is not always bad but he dreads the night on account of the terrible depression when he wakes in the morning. That is the worst part of the day, and in the evening the cloud may lift a little. An inquiry for suicidal tendencies elicits the confession that his thoughts often wander in that direction though, for religious and other reasons, he does not think he would do anything. He has lost weight, he looks and feels ill, and shows dark pigmentation beneath his eyelids. His tongue is dry and coated, his bowel actions are irregular, and he is worried with flatulence. He cannot read a book or the papers although he may glance at the pictures. He is quickly tired by the effort to join in social

amusements but he dreads being left alone. There are two suicides in his family history.

Differential Diagnosis.

I have now outlined very briefly two stories, each of which is characteristic enough for the purpose of differential diagnosis. Let me emphasise the features to which most importance should be attached.

In an anxiety neurosis the depression is variable, and can be favourably influenced by environment or by a restful night. It is regarded by the patient as the result of his illness, not as an essential part of it. The illness itself can be clearly traced to exogenous causes, but the patient does not recognise these as responsible, although he casts the blame for it away from himself. The real anxieties and fears at the bottom of his condition are often difficult to elicit, and may only be reached after much probing and after a state of confidence has been established between the patient and doctor.

In a manic-depressive psychosis the depression, often described as a cloud, is a thing of itself, and is the result of a loss of all feeling. It varies but little, although it is deepest in the early morning, and it is not influenced to any extent by external factors. The patient is quite unable to believe that recovery is possible, but his insight is good and his intellectual perception quite acute. His attitude towards his illness is self-accusatory, and he is often unable to think or talk for a moment of anything but his misery and its suspected cause and consequences. Although the onset of the illness may follow a period of overwork and anxiety, such possible exciting causes are frequently absent and the disappearance of an anxiety has no effect on the course of the illness.

Having indicated by means of two characteristic stories the main points on which differentiation depends it is almost superfluous to inform a medical audience that in many instances the path to a correct diagnosis is not nearly so easy as it appears at first sight or as one naturally hopes for. Although one interview with the patient, sufficiently long to allow him to unburden his mind and expose its contents, may sometimes be all that is necessary for a diagnosis, often several interviews or more continuous observation are required for that purpose. On the one hand there are the cases in which a history, characterised by periodic, sometimes cyclic, recurrences of depression and elation, independent of any satisfactory exciting cause, points clearly to a manic-depressive psychosis. On the other hand, it must be remembered that it is possible for one individual to suffer at different times from an anxiety neurosis and from a mild autonomous depression. Indeed, one sometimes sees recovery from the latter followed by the former without any appreciable interval, the fear of another bout of depression being the exciting cause.

In parenthesis may I emphasise the importance of the study of depression as a clinical symptom, and express my regret that it does not receive the attention it deserves in medical education. It is probably a more common symptom in general practice than dyspnœa or dysmenorrhœa, has as many different causes, and requires as much careful investigation for their successful revelation and appropriate treatment. No one who has really studied the type of depression which I am describing as autonomous, and which involves the loss of all the affective side of life, can doubt that it must be counted among the most poignant forms of human suffering even if it does not actually head the list. That fact alone would justify my insistence on the desirability of sifting the dumping-ground of neurasthenia for a correct diagnosis, but further evidence in support may be obtained from a consideration of the prognosis and treatment of the conditions I have described.

Prognosis.

In both the reactive and autonomous types the prognosis is generally favourable provided that the care and treatment of the patient is wisely and skilfully conducted.

The anxiety state calls for active treatment. The condition represents a reaction to certain causal factors the responsibility of which the patient has failed or refused to recognise. It is based on an inherent or acquired defect in his ability to adapt himself to his environment. A favourable prognosis presupposes the discovery of such causal factors, and the possibility of bringing them and their significance to the recognition of the patient. This process may be easy or difficult but, in any case, demands and justifies the probing and scrutiny of his mind in its present and past aspects. Without the material gained from such investigation the doctor is powerless to restore good health however much attention he may pay to physical or chemical irregularities. Mental readjustment in which the doctor plays an active, aiding, and abetting part is essential for success, and this may be supplemented by such measures as are necessary to restore the habit of sleep and a normal state of nutrition, both of which may readily return under the influence of psychotherapy. It is indispensable that the patient should realise that his mental state is responsible for, and not dependent on, his bodily ailments.

Comparing the prognosis of the manic-depressive with that of the neurasthenic state Dr. T. A. Ross puts his conclusions very concisely in these words:—

> "The depressive is quite sure to become well, provided he is taken care of properly—i.e., if he is not allowed to commit suicide; on the other hand, he will in future years be liable to relapse. The neurasthenic must be made well; he does not tend to drift into good health as the depressive will. If properly cured he should not relapse. The majority of neurasthenic patients, if they are to be made well enough to take their places in society, will achieve the desired result in a few weeks or months; the depressive attack is quite indefinite in duration; it may take weeks, months, or years."

Treatment.

If in both these conditions the prognosis is so dependent on proper care and treatment, some advice in regard to the latter is called for. It might be summed up in a few words: the neurasthenic needs treatment; the depressive needs care.

But this requires some elaboration. I have already indicated that the recovery of the neurasthenic is dependent on psychotherapy and have so far avoided any reference to psycho-analysis. This word has rightly or wrongly come to be used to designate a highly specialised technique in skilful hands, which, as a method of mental investigation has, perhaps, much to be said in its favour, especially from a research point of view. As a form of treatment it is often too prolonged and too expensive to commend itself to all patients, and it is more than doubtful whether it can be regarded as essential to the restoration of health of any but exceptional cases. It is certainly not a method of treatment which can be carried out in general practice, whereas psychotherapy, using the word in its widest sense, is, or should be, part of every doctor's equipment. But the principles underlying the psychotherapy of the anxiety state must be clearly understood if the patient is to recover. The wrong principles are as certain to lead to increased disability as the right principles are to effect a cure. Moreover, in the application of the right principles both confidence and courage on the part of the doctor are not only requisite but can only be brought into play when a favourable atmosphere has been established, sufficiently stable to withstand the shock of home-truths.

Enough has already been said to disclose the general lines of psychotherapy as applied to the neurasthenic and I need only repeat that they *do* include thorough investigation of the patient's mind. Turning to the depressive a principle, entirely opposed to that just enunciated, must be observed and, considering the fact that a large number of depressives are regarded as neurasthenics and never come under special mental care, this distinction is of paramount importance. Of paramount importance not only in

the interests of the patient but because a doctor's credit or discredit often hangs on the manner in which he tackles the problem of depression. Many of these patients are of necessity and indeed often better treated in their own homes, provided that they can there obtain all necessary care and attention, but the situation must be clearly explained to their relatives, who must be ready to cooperate with the doctor and to realise the scope and limitations of his treatment. Let me again quote Dr. Ross in this connexion:—

"Nothing, so far as is known, will shorten the attack, but much can be done to make it safe and comfortable for the patient. . . . It is, moreover, an illness where we must not always expect to gather the fruits of our labour. We may sow and another man reap and obtain much credit which in no way belongs to him. If compensation is necessary to the doctor, he will get it often from some other man's cases. After many months of unwearied attention to a patient suffering from the disease, it often happens that the friends of the patient think a change desirable; they have been told by so many people that this, that, or the other person is the man for such cases, and perhaps soon after the change the long-looked-for cure takes place. But there is an interchange of luck in this respect and the writer has often received credit for the recovery when all that had happened had been that he was the man in attendance at the end. Such undeserved praise or dispraise comes from the friends; the patient always knows better, and there is no class of patient from whom more sincere gratitude is obtained than from a depressive.

"The first essential is that the patient should be under care, and that he should be visited frequently, it may be daily or only every other day. His history should be taken in the same way as was advised for that of the neurasthenic, and the physical condition thoroughly investigated. The patient may be asked whether he has had any anxieties; if he says not, this statement should be accepted without question. It is essential that nothing in the nature of psychological probing should be done to a patient in this group. He will without doubt be a person who is, for the time at any rate, filled with the sense of inferiority, and probing into his past may tend greatly to increase this, and turn a mild case into one of great gravity. Such a procedure may certainly turn a non-suicidal patient into one where the danger is present."

With this grave warning I am entirely in agreement; by itself it forms a strong argument in favour of making a correct diagnosis and an equally potent reason against the use of any form of psycho-analysis in the treatment of the autonomous depressive. It must be remembered that the majority of suicides are committed by these patients and especially by those who suffer from the disease in a moderately severe form. The danger of suicide by a neurasthenic is comparatively negligible in spite of the evidence given in coroners' courts.

For the rest, the treatment of the depressive is largely symptomatic. He is easily tired and certainly made worse by fatigue. His sleep is generally disturbed during a considerable part of his illness and sedative drugs are often indicated and valuable, especially when given in the early hours of the morning, the time at which the patient is inclined to wake and to be at his worst. Light occupation is beneficial but many sufferers are unable to settle down to anything and their restlessness is often distressing.

But perhaps the most important part of the treatment is the daily visit of the medical attendant who must be patiently content to listen every time to the same miserable story and to repeat his assurance that the patient's condition is a well-recognised illness and one which invariably ends in complete recovery. One fine day the doctor may find the patient quite well, the cloud lifted, and peace of mind restored. The recovery is not always so dramatic: it may be gradual and sometimes the cloud may lift for 24 hours and fall again. It is impossible to predict and it is generally wise not to make the attempt.

An Everyday Problem.

My attack on the Dumping Ground is fading away. It began with the creditable intention of turning over, sifting and criticising everything with neurasthenic pretensions. I am aware that I should have found many oddities of interest in the process. There would have been revealed cases of unsuspected organic disease, of mild encephalitis, and of early general paralysis. Here and there an incipient dementia præcox or a compulsion neurosis might have come to light. But in very truth my objective was to present the differentiation of the anxiety neurosis from the manic-depressive in the plainest colours, and to show that such differentiation is not a matter of mere academic snobbishness but an everyday problem of outstanding importance to all who practice medicine.

An Address

ON THE

CLINICAL APPLICATION OF THE NEWER CONCEPTIONS IN THE PHYSIOLOGY OF THE EYE.

Delivered on receiving the William McKenzie Memorial Medal at Glasgow on Dec. 2nd

BY W. S. DUKE-ELDER, M.D., D.Sc. ST. AND., PH.D. LOND., F.R.C.S. ENG.,

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THE development of any science tends to proceed, not with a regular and even current, but intermittently, like a river which in its placid onward course every now and then bursts into life to hurl itself against the rocks and dash itself pell-mell down a cascade. We get periods of intense creative activity wherein new ideas are developed and new theories are evolved, frequently in bewildering confusion and usually half assimilated; and these are followed by periods of relative quietude wherein these new ideas are consolidated—periods, it is true, less dramatic, but nevertheless as useful, wherein the flotsam can be discarded and that which is good and of permanent value can be gathered, assorted, and stored.

I would like to divide a review of the history of ophthalmology into five such periods as these. The first may be said to have culminated in the middle of last century with the great clinician whose memory we are keeping alive to-day. It is difficult to name this period, but perhaps it may justly be called the age of clinical intuition. It is more difficult to realise the handicaps and disabilities under which these early workers laboured, relying entirely upon the evidence of their senses and the lessons of their experience, without any means of detailed clinical examination, without asepsis and with no anæsthetics, with little or no pathological knowledge, with a meagre physiology and with no biochemistry. But when we realise their difficulties we can only marvel at the clinical acumen and profound insight to which the greatest of them attained, which allowed William McKenzie to establish the fact of sympathetic ophthalmitis, to lay his finger on the essential factor in glaucoma, and to write one of the most extraordinary works on ophthalmology in the whole of the world's literature—his "Treatise on the Diseases of the Eye." The second period was born with the ophthalmoscope, and when the inner eye could be directly observed by means of Helmholtz's instrument, ophthalmology became galvanised into an age of activity the like of which it had never seen before. The third period was the age of the microscope, when with the intensive study of pathology that engaged all the clinics of Europe at the end of last century and the beginning of the present one, our knowledge of the gross anatomy of diseases of the eye increased by leaps and bounds; it was a period full of memorable achievements, and it yielded a harvest the value of which will stand for all time. When Gullstrand perfected the slit-lamp some 18 years ago, a fourth era was ushered in, when the study of the

pathology of the dead gave way to the study of the pathology of the living. Although it is easy to overestimate its value, it cannot be denied that the greater facilities with which this new method of examination provided the clinician gave an immense impetus to research, and was responsible, and is still, for a mass of clinical observations which, without its aid, would have remained largely academic and divorced from the routine and practice of the clinic.

But I think it must probably be admitted that while the spirit of clinical inquiry is with us always, the ophthalmoscope has told us most of its secrets, the microscope has pictured most of the mysteries to which histology can reach, and even the slit-lamp, although it has not yet expended all its potentialities, can hardly create a new revolution. Man, in his insatiable quest for more and yet more knowledge, is turning to something else. This brings us to the fifth stage in the history of our subject; and I hope that time will show that I am not over-optimistic when I propose to call it the age of physiology and biochemistry.

A New Point of View.

We all know of the clinical picture presented to us by McKenzie; we have seen the eye through the ophthalmoscope of Helmholtz, the microscope of Bowman, and the slit-lamp of Gullstrand. I want to put before you a further picture; I am going to ask you to look at ophthalmology with the eyes of a chemist and physiologist. I shall ask you to look upon the eye, not as an organ built up of a few component parts—of three outer tunics and three inner humours—but to look within and beyond this picture to something more fundamental, to lose your accustomed sense of magnitudes, and see an infinitude of molecules and atoms, each inordinately busy travelling in its own appointed path, each running within the limits of certain laws, and controlled by complex but unalterable forces: the whole assemblage partitioned off by membranes through which in certain circumstances they may pass, semi-isolated but coördinated, so that they all together comprise a teeming biochemical factory, complete in itself, but at the same time working in harmony with the larger biochemical factory of the body of which it forms a part.

The most fundamental thing which has occurred in biochemistry in recent times is the establishment by Prof. F. G. Donnan of the laws which govern the passage of dissolved substances through membranes. The whole body is divided up into cells, each separated by membranes from its neighbours, and even within the cell itself there is a complexity of potential membranes. All the active constituents of the body are dissolved in watery solution, and hence it follows that all the activity which takes place, and all the means of communication between the individual cell-units, must necessarily resolve itself into a question of the passage of dissolved substances through membranes. The matter, however, is not so simple as at first sight it may appear, for the membranes, as a rule, allow only the smaller molecules to pass through them and keep the larger ones behind. This provides one means of complication. Moreover, we know that each molecule of salt in solution is broken up into two ions, each of which carries an electric charge—the one a positive charge and the other a negative. Since, therefore, a free diffusion of all ions equally is precluded by the semi-permeability of the membranes, this rearrangement and difference in concentration at once involves the development of hydrostatic, osmotic, and electrostatic forces. Stability and equilibrium can only be reached when all these forces are made to balance, the one compensating for the other. It is the interaction and rearrangement of these forces which is necessary to prevent the occurrence of an explosion, as it were, that constitutes a thermo-dynamical equilibrium.

We will see more clearly what is entailed by this conception when we take a specific instance; but I should like to divide the whole of the vegetative physiology of the eye into four such equilibria: (1) The equilibrium between the blood plasma in the capillaries and the intra-ocular fluid. (2) The equilibrium between the intra-ocular fluids and the vitreous body. (3) The equilibrium between the intra-ocular fluids and the lens. (4) The equilibrium between the blood plasma in the chorio-capillaris and the sensory epithelium of the retina.

The Intra-ocular Fluid.

We will look first of all at the equilibrium between the blood and the intra-ocular fluid, because this is the most fundamental one. By the intra-ocular fluid I mean not only the aqueous humour but also the fluid in the tissue spaces of the eye, in the uveal tract, in the cornea, and in the retina—all the fluid within the sclerotic, in fact, which is not included within the compass of the other three equilibria.

It is through the membrane formed by the capillary wall that all vital changes associated with the interchange between the blood and the tissues take place. We can picture the mechanism by a scheme like the following, where we will presume, for the sake of simplicity, that the blood possesses two kinds of molecules only: large molecules (protein, such as sodium albuminate), the colloid part of which cannot get through the membrane, and smaller molecules which can. Some of the latter are broken up into particles which are ionised and carry an electric charge (salt), and some which, being non-electrolytes, are not thus broken up (sugar). Now when we try to establish connexion across the membrane, the negatively

Blood.	*Aqueous.*
A^-	
Na^+	
Na^+	Na^+
Cl^-	Cl^-
S	S

charged albuminate (A) is held back, and with it, for electrostatic reasons, some of the positively charged sodium ions will be retained also. So far as the diffusible ions are concerned (NaCl) Donnan has shown that, in order to attain a state of equilibrium, they must obey certain conditions by which the products of their concentrations are equal on both sides of the membrane. It follows, since there are more positively charged sodium ions in the blood, that there must be more negatively charged chlorine ions in the aqueous humour. The sugar (S) which, not being ionised and carrying no electric charge, is not subject to those electrostatic constraints, is free to distribute itself equally between two fluids. We have, therefore, a definite and well-defined concentration of the various chemical substances, and this concentration involves specific osmotic and electrostatic forces which combine together to equilibriate each other.

Let us pause for a moment to see how actual facts conform to these theoretical considerations. A thorough analysis of the chemical composition of the aqueous humour [1] shows that it contains all the constituents of the blood plasma. The colloids, however, not readily obtaining a passage through the membrane, are present only in traces; the non-electrolised constitutents are present in equal amounts, and the ionised substances are partitioned exactly in the proportion which the postulates of a thermodynamical equilibrium necessitate. I know of few biological relationships where theoretical values are so exactly attained. For example, I have found that while the sugar in the arterial plasma is 0·158 g. per cent. and in venous 0·133 per cent., that in the aqueous is 0·151 g. per cent., which approximates the value which must of necessity be found in the capillaries. Again, to take an ionised substance, the concentrations of normal sodium in the aqueous and in the blood are as 121 : 145, while those of the chlorine similarly expressed are as 123 : 103. We see that the concentration of negatively charged chlorine in the aqueous is the greater, and the concentration of positively charged sodium in the blood is the greater; and when we take the product of the ions of the two fluids, which

theoretically should be equal, we arrive at the figure 148·83 = 149·35—an exceedingly close approximation for any biological estimation.

So much for the chemical equilibrium; let us now turn to the physical one. The osmotic pressure of the aqueous humour[2] exactly corresponds to the very precise value necessitated by the peculiar distribution of ions which we have just considered. The differences in electrical charge imply a difference in electrical potential between the two fluids, and if this is measured galvanometrically by inserting one electrode into the jugular vein and the other into the chamber of the eye, this difference is obtained. Again, the hydrostatic pressures in the eye[3]—the pressure in the entering arteries,[4] in the exit veins,[5] and the pressure in the chambers of the eye—are at exactly the correct level.[16]

Moreover, in abnormal conditions changes take place in the aqueous humour exactly in terms of the some equilibrium.[6] An alteration may be brought about by two conditions: first, by altering the permeability of the capillary walls so as to allow more substances through from the blood; and second, by altering the composition of the blood so that different materials are available to pass through. In the first case if the capillary permeability is increased, as by a dilatation of their walls, a greater amount of colloids will get into the eye and thus an albuminous or plasmoid aqueous is formed. Here, since the electrical strain between the two fluids is now lessened, the concentration of the positive ions increases while that of the negatively charged ions diminishes, the osmotic pressure and the electrical potential fall, the concentration of hydrogen ions rises, and the pressure of the eye increases. This always occurs in such a way that a perfect thermodynamical equilibrium is continually maintained no matter how the alteration in capillary permeability is brought about, whether by processes so divergent as a simple paracentesis or an inflammation of the eye. In the alternative case, if the composition of the blood is altered, the constitution of the aqueous humour alters again according to thermodynamical laws. Large-sized molecules injected into the blood even in abnormal concentration will not find their way into the eye except in traces. Thus dyes like trypan blue or congo red do not enter the aqueous humour, and the difficulty of facilitating the entrance of drugs like the large-moleculed organic preparations of arsenic is thus explained. To a large extent this accounts also for the therapeutic value of a paracentesis, which, by increasing the capillary permeability, allows the more ready passage of substances of this nature. Further, if positively charged cations are added to the blood they enter the eye only with difficulty. The basic dyes, as neutral red, methylene-blue, kresyl blue, fuchsin, and others, as well as metallic ions such as sodium, mercury, or bismuth, come under this category. On the other hand, negatively charged anions enter readily, dyes like eosin, chrysolin, orange G. and anions such as iodides, chlorides, bromides, and organic anoidal substances such as salicylic acid. It is evident that what used to be called the "selective permeability" of the ciliary epithelium, and which used to be cited as evidence of its secretory activity, is a purely physical process determined by thermodynamical laws.

On either side of the capillary walls there is, therefore, a balancing thermodynamical equilibrium comprised of complex but well-determined chemical, hydrostatic, osmotic, and electrostatic forces. Around this level the mutual compensating forces are continually fluctuating, and in any capillary they will determine a flow of fluid outwards at one moment and inwards at another, accompanied by a diffusion outwards or inwards of diffusible substances according to their several differences in concentration and determined by the nature of their electric charge, while the whole is subject to a readjustment depending on the colloid impermeabilities. This fluid percolates through all the structures within the sclerotic, through the stroma and the cellular elements of the ocular tissues, through the substance of the cornea, and eventually through the endothelium and epithelium lining the anterior and posterior chambers, filling up these cavities.[7] Throughout its passage across it is modified by metabolic activity and by the stresses to which it is exposed; at all points in its course, between each cell and between the interfaces within each cell, fresh membranes or potential membranes have to be traversed, each involving a new system of forces with the corresponding adjustments which these entail, and each necessitating a fresh state of thermodynamical equilibrium. While this reciprocal interchange occurs throughout all the tissues of the eye, circulatory conditions to a less extent, and the influence of muscular activity to a greater extent, will determine a slow through-and-through circulation of fluid through the chambers of the eye, which will find its exit mainly by way of the canal of Schlemm[8]; while differences of temperature within the anterior chamber itself determines an internal thermal circulation.[6]

THE VITREOUS BODY.

So much for the first equilibrium; we are now in a position to deal more rapidly with the others. The chemical examination of the vitreous body[9] shows that it is made up of all the constituents of the aqueous humour in corresponding proportions with the addition of two specific colloid constituents of ectodermal origin: a mucoprotein and a second protein substance the exact chemical nature of which I have not yet been able to elucidate, and which I am, therefore, in the meantime calling a "residual protein." Each of those two substances has a special function, that of the mucoprotein being the maintenance of transparency, and that of the residual protein the potentiality of gelability. The ultra-microscopic examination of the vitreous body[9] and a study of its physical properties demonstrate beyond doubt that it is, in a fresh and healthy state, a simple and homogeneous jelly or gel; that the fibrillar appearances seen histologically by the microscope are artifacts of coagulation, and the membranous appearances seen clinically by the slit-lamp are similarly optical artifacts. A study of its vapour pressure isotherm[10] shows that it is an elastic turgescible gel, capable of swelling and shrinking. Further, a study of its various reactions shows that, within the limits compatible with life, it tends to swell if the concentration of hydrogen ions is increased, and to shrink if this concentration becomes smaller; while, if its metabolism is upset, the whole gel structure tends to break down, the vitreous body turning fluid and the residual protein material becoming thrown out from its combined state into coagula forming fibres and strands and membranes such as are apparent in the clinical pictures of vitreous opacities with which we are all acquainted.

Here, then, is our second equilibrium. Two special colloid substances are secreted by the surrounding ectoderm, each having a special function of their own; these are percolated by the common intra-ocular fluid which enters into physicochemical combination with them, and the result is the formation of a gel. Always between the two, the intra-ocular fluid and the vitreous body, a continuous thermodynamical equilibrium exists, on the conditions of which depend events like the swelling of the vitreous body, or its shrinkage, or its breakdown into a fluid and the formation in it of opacities; while, superimposed upon this, and dependent to a large extent upon it, is the internal metabolic activity of the vitreous body on the efficiency of which depends its continuance as a homogeneous, solid, and transparent mass.

THE LENS.

The third equilibrium is that between the intra-ocular fluids and the lens. In this case we have some additional stresses in question. The lens to a certain extent forms a separate physicochemical mechanism semi-isolated from the remainder of the eye; its chemical composition is widely different from that of the intra-ocular fluids, to which, indeed, it may be said to bear a relationship showing some points of analogy with the relationship between the red blood corpuscles and the plasma. Corresponding to this,

the osmotic pressure of the lens is considerably higher than that of the aqueous by which it is surrounded; it is, in fact, higher by an amount which is approximately equal to a 0·3 normal solution of sodium chloride. Owing to the tonic pull of the capsule through the zonule the internal tension of the lens is kept at a higher level than the remaining tissues of the eye; and therefore it follows that the osmotic tendency for fluid to enter the lens is counterbalanced by the opposing force exercised mechanically by the tension of the capsule favouring the hydrostatic diffusion of fluid out of the lens. Superimposed upon the normal thermodynamical equilibrium, there is therefore a constant expenditure of osmotic work acting against the filtration pressure generated by the ciliary muscle. The effects of the disruption of these forces are seen in their most dramatic form when the hydrostatic component is abolished by a rupture of the continuity of the capsule, and a traumatic cataract is formed. It is seen almost as dramatically when the osmotic balance is disorganised in diabetes when fluid tends to enter the lens.[11] If the process is a mild one the lens swells and is deformed, its curvature and refractive powers are increased, and the acute myopia of diabetes results [15]; if the process is more active, actual droplets of fluid are formed underneath the capsule, and eventually a typical diabetic cataract results. Again, if the efficiency of the membrane is impaired by radiant energy, the abnormal interchange which is thus allowed may, with a direct denaturation of the lens proteins, combine to bring about a radiational cataract.

We have thus a delicately balanced equilibrium between the intra-ocular fluids and the lens on either side of the membrane formed by the lens capsule. The story, however, does not end here. We have here again the same combination of two sets of circumstances as we have seen in the vitreous body. There is first the outer equilibrium, and here again it is to be noted that the two great factors in its derangement which are of greatest importance are an alteration in the concentration of the hydrogen ions and an alteration in the concentration of salts—both of these lead to swellings and shrinkages and disorganisation of the vitreous body, and both of them lead experimentally to the formation of opacities in the lens. The second set of circumstances is the internal metabolism. It has been shown that the metabolism of the lens is subserved by an internal autoxidation system, one of those very interesting and widely occurring mechanisms by which a chemical reaction is maintained in a state of constant and balanced activity, so that a continual reciprocal process of oxidation and reduction is maintained without any mediation of the gases of the blood stream. In this mechanism glutathione acts as a hydrogen donator and β-crystallin acts as a thermostable residue, and it has been shown that an upset of their reversible interaction is a constant accompaniment of the development of cataract. This again is essentially and primarily dependent on the state and the conditions of the outer equilibrium.

The Retina.

The fourth equilibrium we can deal with rapidly, not because of its less importance, but, unfortunately, because of our less knowledge of it. The inner cerebral layers of the retina are nourished by dialysation from the retinal vessels just as are the other ocular tissues, with the reservation that, provided as these vascular channels are with insulating perivascular glial sheaths, the cerebral type of circulation is maintained. But the sensory epithelium of the retina receives its nourishment by dialysation through the more distally placed vessels of the chorio-capillaris. Experimental evidence has been brought forward that a local upset of this process produces a derangement of the physico-chemical activity of the precipient elements of the retina such as is apparent clinically as a scotoma. I think it is probable that a disturbance of some such nature as this will eventually be found to account for some of the visual symptoms which may be present in disease. For example, in glaucoma, although the visual symptoms usually run parallel with the major symptom of tension, it cannot be claimed that the parallelism is invariably maintained, and it seems to me not unlikely that, if physico-chemical disturbances in the first two equilibria which we have discussed can give rise to a turgescence of the vitreous, which is evident clinically as a rise of tension, similar or related disturbances in this fourth equilibrium can as easily and as logically put out of gear the still more delicate physico-chemical mechanism which converts radiant energy into nerve impulses in the retina.[13]

Clinical Applications: Glaucoma.

It will be realised that the clinical applications of these physiological considerations are far-reaching. Apart from inflammatory conditions, the pathology of which resembles that of similar conditions occurring in the other organs of the body, almost all of the major diseases of the eye, the treatment of which offers so many baffling problems, resolve themselves into exercises in physico-chemistry. Glaucoma, for example, is not, I think, a condition primarily of raised tension, but is an upset of the entire internal economy of the eye, most usually of a physico-chemical nature, the most frequent and clamantly obvious manifestation of which is an increase in the intra-ocular pressure. The facilities for drainage at the canal of Schlemm are not usually (although they certainly may be sometimes) the primary cause of the trouble; they frequently form the last link in a chain which determines mechanically the final crisis in the disease. There are probably two main factors in the ætiology of this disease, two factors which perhaps determine two types of the disease.[17] Pathologically these two types are evident; the one wherein the uveal vessels are dilated and are surrounded by an abundant exude of fibrinous coagulum; the other where the uveal tract and all the tissues of the eye are compressed and flattened by a swollen vitreous body. The first factor is a derangement of the capillaries, involving a dilatation, an increased permeability, and an upset of the first equilibrium between the intra-ocular fluids and the blood plasma. This may be dependent upon general causes—toxæmic, infective, dietetic, hormonal; it may be related to a derangement of the sympathetic nervous system; or, on the other hand, experimental evidence which we are at present accumulating suggests that it may be to some extent due to the local activity of specific substances in the eye such as choline. The second factor is an upset of the second equilibrium involving physico-chemical changes, such as swelling and turgescence, in the vitreous body. The occurrence of such an upset may depend upon considerations such as the concentration of hydrogen ions [13] or of salts [4] in association with the vitreous body, the inter-relation of its iso-electric points, its oxidative mechanism, or its internal metabolic activity. Certainly the clinical picture seen in many cases of acute glaucoma, and frequently of chronic glaucoma, strongly suggests that a swelling of the vitreous body is of primary importance. The shallow anterior chamber, the obvious pushing forward of the lens and iris, the thinning of the choroid and compression of the retina, combined with the fact that in quite a fair percentage of cases the angle of the iris seems pathologically to be free, points to this conclusion. If a damming back of fluid at the filtration channels were the primary cause, we would look for a deep anterior chamber owing to the retention of the aqueous humour. An obstruction of the filtration passages certainly abolishes the safety-valve mechanism which tends to prevent rises of pressure in the eye by allowing an escape of fluid; but it seems that, in many cases, its part in the ætiology of the disease is that of an adjuvant rather than of a primary factor. It may be that, in most cases, the changes in the vitreous depend primarily upon vascular changes and a derangement of the first equilibrium; while, on the contrary, it is possible that metabolic disturbances in the vitreous itself may secondarily promote the formation of choline-like bodies in the eye which may

secondarily produce a vascular crisis in the capillary circulation. Or, even more probably still, the one may aid and abet the other, and a vicious circle may be inaugurated and maintained until the eye itself is strangulated.

Detachment of the Retina.

Again, idiopathic detachment of the retina very probably results directly from changes of the opposite kind, for I think that it is likely that it is preceded and accompanied in the great majority of cases by shrinkage and liquefaction of the vitreous gel. Such a liquefaction can be brought about in the laboratory by simple trauma or by an interference with its normal metabolism, in either of which case the gel breaks down and the residual protein separates out. When this occurs and when liquefaction or shrinkage of the gel takes place, the process is accompanied by a change in the physical state of the comparatively large quantities of water retained by absorption by the colloidal elements of the vitreous; this fluid, being released from its "bound" condition, will once more revert to its original state of "free" intra-ocular fluid. As such it can readily escape from the vitreous chamber, or even leave the eye through the filtration channels at the angle of the anterior chamber in the same way as the rest of the aqueous humour. Any small degree of increased tension in the eye from any cause whatever, no matter how incidental it may be, will involve a loss of some of the intra-ocular fluid through the filtration spaces at the angle of the iris. This is replaced by the exudation of a fluid rich in colloids during the phase of low tension which follows the phase of high tension; any increased capillary permeability arising, for example, from a local inflammatory lesion will lead to the same result, and the fluid thus exuding from the dilated choroidal capillaries will collect more easily underneath the ill-supported retina than any other place. With the retina unsupported by a solid mass, therefore, and deprived of a resilient and steady pressure from within-side, the stage is set and everything is ready for this tissue floating away from its surroundings on the slightest provocation. In this case the essential precursor and primary factor in the ætiology of a detachment of the retina of this nature is a biochemical change in the vitreous body involving a shrinkage of the gel mass and the replacement of part of its volume by free fluid; or, alternatively, a liquefaction of the whole or part of the gel with the formation of a sol containing opacities. It follows that the treatment is ideally by physico-chemical means, by bringing about a solidification and returgescence of the gel which will push the retina by pressure from behind back into place and retain it there.

Vitreous Opacities.

I have shown experimentally that the vitreous body in normal conditions is a gel in a high state of turgescence; as such it possesses an extreme degree of lability. So much is this the case that it can be transformed into a fluid solution by any slight interference with its normal condition. Now this gel-sol transformation is accompanied by the formation of a cloud of minute punctiform opacities and by the separation of the highly gelable residual protein into long films and strands. A similar transformation occurs under the influence of acid or alkaline solutions. In these circumstances the clear mass of gel shrinks up into a small fraction of its original volume; this, of course, is due to a loss of water on a large scale by the individual particles which become deturgesced and occupy a small fraction of their original volume. The fluid thus lost separates out as a clear solution leaving the shrunken gel mass behind. At the same time the gel becomes interspersed by an ever-thickening felt-work of white strands and fibres which alternate with gossamer-like membranes floating about in its interior, and the process goes on until the whole mass becomes turbid and opaque. This behaviour is exactly simulated by a gel of gelatin when it is saturated beyond its solubility limit at its iso-electric point, under which circumstances it turns into an opaque suspension.

We have thus arrived at an explanation, or at any rate at a tentative explanation, of the occurrence of one class of vitreous opacities. We may divide these into two kinds: first, exogenous materials, foreign inflammatory products which are derived from the ciliary body, the choroid, and the retina in cases of cyclitis, choroiditis, and retinitis. The pathology of these is already well understood; they are of the nature of exudates, leucocytes, and other inflammatory products, which may remain unchanged in nature for an indefinite time, or may undergo organisation, or even may assume frankly purulent characteristics. The second class of opacities is autogenous in nature, derived from the vitreous body itself by its partial or complete breakdown. Such a breakdown could readily be brought about clinically by a derangement of the metabolism of the vitreous such as would be caused by low-grade toxins, or by mild inflammatory processes. The strands and diaphanous sheets and membranes seen floating about in a fluid vitreous in a case of chronic cyclitis provide an appearance strikingly similar to that obtained experimentally in the test-tube when the proteins, especially the "residual protein," become coagulated out. Such is almost certainly the nature of the so-called "degeneration" of the vitreous in which the mass turns fluid and becomes filled with opacities which occurs in infective conditions, in senility, in advanced myopia, and which accompanies detachment of the retina.

Cataract.

Cataract, as we have seen, is another purely physico-chemical problem—the denaturation, hydrolysis, and coagulation of the proteins of the lens—and the essential opacities which occur in the cornea seem to be of the same nature. All of these conditions will before long be explicable, and all of them should eventually be curable or preventable by physico-chemical means.

Do not misinterpret me here. So far we can neither cure nor prevent a single one of them. With regard to some of them, it is true, we have got inklings of possible paths which may perchance lead us far along the road, and here and there one or two sign-posts have been erected leading no one knows whither. But on the whole we are merely at the stage of work, and work largely in the dark, relieved only by hopes and aspirations; and not within the lifetime of any of us will all of these hopes and aspirations be realised. I am merely trying to suggest a new point of view. In the past we have been looking at the diseases of the eye almost entirely from the viewpoint of anatomical pathology—a most useful and, indeed, a necessary stage in the evolution of knowledge. But hitherto we have tended to make too much, I think, of the structural ruins which disease has left behind it, and we have failed to see the deeper and more subtle nature of the initial defect.

Again, do not misinterpret me by crediting me with the suggestion that with the knowledge of physico-chemistry which we possess or which we can ever hope to possess, we will ever be able to penetrate fully into the processes of life and disease. It is true, I am convinced, that the body is a physico-chemical mechanism, and that consequently a physico-chemical method is the only one which can legitimately and rationally hope to elucidate its activities. But still more certainly we know that the chemistry or the physics at our command does no more than touch the fringe of the universe of natural phenomena. It would be dangerous to delude ourselves that there is any physiological process at all, with its multiplicity of parallel reactions, interdependent, inter-related, and interwoven, which is as yet so susceptible to simplification that it can be accounted for by a definitive explanation along these lines. At the same time I see no reason to despair that eventually the instability and plasticity of the physico-chemical structure of protoplasm may permit of an adequate and pragmatic explanation, and it seems reasonable to hope that in the future its ceaseless evolution, its histogenic powers,

and its teleological attributes may to some extent, at any rate, be clarified. But even if it does finally become apparent that knowledge in its progress will never reach this goal, but, "like curves of the geometrician, will always approach but never attain its asymptote," we, in our own time, can share the spirit of adventure of the voyager who sails one stage further out upon the uncharted sea. And if we, as a generation witnessing these researches after truth, sharing in them, and doing our part to help them along, add even one small quota to the sum of experience and hand it on to our intellectual heirs, we, as a generation, may have it haply said about us that we picked up the mantle so grandly worn by McKenzie, and have done our best to carry it gallantly and well.

REFERENCES TO PAPERS BY W. S. DUKE-ELDER.

1. Biochem. Jour., 1927, xxi., 66. 2. Jour. Physiol., 1927, lxii., 315. 3. Brit. Jour. Ophthal., 1926, x., 513. 4. Jour. Physiol., 1926, lxii., 1. 5. Ibid., 1926, lxi., 409. 6. The Nature of the Intra-ocular Fluids, Brit. Jour. Ophthal., Monographs, 1927, iii. 7. Proc. Roy. Soc. Med., 1928, xxi., 817. 8. Brit. Jour. Ophthal., 1927, xi., 388. 9. Jour. Physiol, 1929, lxviii., 155. 10. Trans. Ophthal. Soc., U.K., 1929, xlix. 11. THE LANCET, 1926, i., 1188, 1250. 12. Report Internat. Cong. Ophthal., Amsterdam, 1929. 13. Brit. Jour. Ophthal., 1929, xiii., 385. 14. Ibid., 1926, x., 1, 30. 15. Ibid., 1925, ix., 167, 382. 16. Jour. Physiol., 1927, xliv., 78. 17. Brit. Med. Jour., 1928, ii., 236.

TREATMENT OF PERFORATED PEPTIC ULCER.

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MUCH has been written in recent years on the treatment of perforated peptic ulcers of the stomach and duodenum, and it is surprising how much opinion differs about the best surgical procedure. Some surgeons favour primary gastro-jejunostomy as a routine, whilst others never carry this out at the primary operation. Guthrie [1] sent a questionaire to 149 surgeons in America to ascertain their practice, and found that 22 performed primary gastro-jejunostomy as a routine, 64 never performed primary gastro-jejunostomy, and 63 performed primary gastro-jejunostomy in a shifting percentage depending on the condition of the patient. In view of these differences in practice it may be of interest to record the results of 158 cases of perforation of the stomach and duodenum operated upon in one hospital by several operators* in the last seven years, all using the same technique.

Briefly, our practice has been to operate upon all cases without selection—to close the perforation, to drain the peritoneal cavity, never to do primary gastro-jejunostomy, and to complete the operation with all speed.

Age Incidence.†—Perforation is uncommon in patients under 25 years and over 60 years of age. It occurs most frequently in the fourth and fifth decade but it is quite common in the sixth. Table I. shows the number of cases in each decade.

Sex Incidence.—In this series 152 were males and 6 were females, a proportion of 25 to 1. Two of the female cases were duodenal perforations and the remaining four were gastric.

* In addition to the writers of this paper, Dr. G. S. Gawne, Dr. W. J. Birchall, Dr. T. R. Robertson, and Dr. S. C. Gawne.

† Since this paper has been written, a case of perforated gastric ulcer in a boy aged 16 years has been admitted to hospital. This case is being reported elsewhere by Dr. R. A. M. Pennington.

Site of Perforation.—In our experience duodenal perforation is more frequent than gastric perforation. Of the 158 cases, 124 were duodenal and 34 gastric, giving a proportion of approximately four duodenal

TABLE I.

Age in Q. G.	Total cases.	Duodenal.	Gastric.	Age in Q. G.	Total cases.	Duodenal.	Gastric.
Under 20	1	1	0	50–54	20	16	4
20–24	10	8	2	55–59	11	6	5
25–29	22	20	2	60–64	5	2	3
30–34	19	15	4	65–69	5	4	1
35–39	22	20	2				
40–44	20	15	5		158	124	34
45–49	23	17	6				

Q. G. = Quinquennial groups.

and one gastric. In no cases have we found more than one perforation at the time of operation. Recurrence of perforation at the same site has occurred in three cases: in one after an interval of 11 months, in another after four years, and in the remaining case after five years. In two of these cases no gastro-jejunostomy had been performed; in the third gastro-jejunostomy was performed but was undone at a later date for jejunal ulceration. Two years after the normal anatomy of the stomach had been restored perforation occurred again. Sometimes there is difficulty in deciding the exact site of the perforation in juxtapyloric cases, and our method of discrimination is to inspect and to palpate the pylorus carefully. The pyloric vein usually indicates the boundary-line between stomach and duodenum, but we place more reliance on the palpation of the pyloric sphincter by the finger and thumb of one hand to indicate the exact site of the lesion.

Treatment.

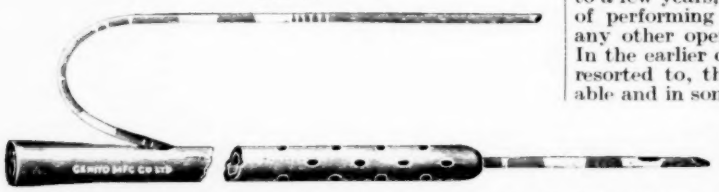
As soon as the diagnosis of perforation is made the patient is placed in the Fowler position and is prepared for operation. His transit from ward to theatre should be performed with the least possible disturbance of this position—that is to say, pillows are placed under the head and shoulders on the ambulance trolley and he is transferred to the operating table already fixed in an inclined position of 20 degrees from the horizontal. We believe that if this position is adopted from the beginning and maintained the bulk of the fluid gravitates to the pelvis by the time of operation, and less swabbing of the upper abdomen is required. Morphia gr. 1/6 and atropine gr. 1/100 are given as routine before operation. The anæsthetic employed in the majority of our cases has been open ether, but latterly we have used gas, oxygen, and ether.

Incision.—A median incision is used, extending from near the xiphoid sternum to the umbilicus. We have found this to give adequate exposure of the perforation in all our cases. The advantages over the paramedian incision are that this incision consumes less time, does not open the rectus sheath, and does not interfere with the use of the paramedian incision for any subsequent operation that may be required.

Closure of the Perforation.—The perforation is immediately sought and the fluid that usually obstructs the view is gently mopped up. The pyloric end of the stomach is held by the finger and thumb of the assistant in such a way as to bring the perforation towards the abdominal incision without exerting any undue traction. If the perforation is pyloric or duodenal, as it most frequently is, the right lip of the incision and the edge of the liver are protected by a swab and retracted. The perforation is closed with a single mattress stitch. Not infrequently, owing to surrounding inflammation, this is not possible, as the stitch cuts through the friable tissue; the surgeon therefore has to proceed to the next stage.

The ulcer is now infolded by a continuous catgut suture which, in the pyloro-duodenal area, should be transverse to the axis of the bowel and should begin well below and end well above the perforation. We use one seromuscular suture only, as the use of more causes too much invagination and consequent obstruction at the site of the ulcer. When there is much local induration and œdema it may be necessary to go some distance from the perforation to get tissue that will hold the suture. In cases of doubt the suture line is reinforced by stitching over it a piece of the right edge of the great omentum. Where the ulcer is a large one and the surrounding induration and inflammation is extensive the amount of infolding that is necessary to ensure closure of the perforation causes definite obstruction at the pylorus. This is overcome by a special procedure, the double tube technique, that will be described later.

FIG 1.



The double drainage-tube described in the text. (Made by the Genito-Urinary Manufacturing Co., Ltd., London.)

Excision of the Ulcer and Pyloroplasty.—We have done this in nine cases only. It takes extra time, but not so much as is required for a gastro-jejunostomy. It is not suitable for all cases, and can only be carried out with ease where the duodenum is movable. Of 55 consecutive cases in our series 26 have been suitable for excision and pyloroplasty as judged by the mobility of the duodenum and size of the ulcer perforation. When the duodenum is fixed to the posterior abdominal wall the operation is a difficult and dangerous one. Of our nine cases, three died; in one the result was unsatisfactory and in five satisfactory. Rowlands and Turner [2] quote twelve cases of primary pyloroplasty, of which five had recurrence of symptoms.

Cleansing the Peritoneal Sac.

Peritonitis is still the most frequent cause of death after operations for perforated peptic ulcer, and the prevention of this complication is of cardinal importance. While fully appreciating the natural power of the peritoneum to deal with noxious contents, it is easy to err on the side of expecting the peritoneum to do too much. It is argued that a large proportion of the fluid is protective peritoneal exudate. This is undoubtedly true, but at the same time analysis of the fluid shows that a very substantial portion of it is gastric contents, containing partially digested food, gastric secretion, mucus, and bile—all substances very noxious to the peritoneum. If such fluid can be removed by means other than peritoneal absorption it is clearly an advantage to the patient. Further, the infectivity of the fluid must be considered. In this connexion the observations of Bruett [3] in 112 cases are of importance. He reports that in the cases that were operated on from six to twelve hours after perforation the exudate was sterile in only 26 per cent. In cases more than twelve hours old only 7 per cent. had a sterile exudate. Among the bacteria found were staphylococci, *Streptococcus hæmolyticus*, *Streptococcus viridans*, and *Bacillus coli communis*. The type of infection and its virulence must always remain an unknown factor at the time of operation, and obviously the safest procedure is to remove as much as possible of this potential cause of peritonitis.

The ideal method of removing the fluid is one that does not entail manipulation and disturbance of the abdominal contents, and does not traumatise the endothelial covering of the peritoneum. Flushing, which at one time was the common practice, is now almost entirely abandoned. It was ineffective, spread contamination, lowered the blood pressure, and gave very unsatisfactory results. In our earlier cases we used swabbing extensively, but later experience has led us to use it less and less. In 62 of the cases we have at times, varying from a few months to a few years, reopened the abdomen for the purpose of performing a gastro-jejunostomy or carrying out any other operation that may have been indicated. In the earlier cases, where swabbing had been widely resorted to, the peritoneal adhesions were considerable and in some cases extensive. In the later cases, where swabbing has been reduced to a minimum and the chief reliance placed on drainage, the adhesions have been far fewer and in many cases practically absent. We have used suction in several cases but have been disappointed with it. It certainly removes a pelvic collection of fluid very effectively, but that is not all the fluid that is present. There is still a film left between the coils of intestine and mesenteric folds and, though the quantity in any one place is small, the amount in the whole contaminated area of peritoneum is considerable. For the removal of this disseminated contamination suction is ineffective. Moreover, the great omentum behaves almost like fluid and becomes entangled in the nozzle of the aspirator no matter what type of guard is used. Disengaging the omentum causes trauma and waste of time.

We now depend almost entirely on suprapubic drainage and, except in cases where the amount of intraperitoneal fluid is very small, we use drainage as a routine. In this series only three cases were closed without drainage. The insertion of a split tube through a suprapubic stab wound down to the floor of the pelvis and the rigid maintenance of the Fowler position we have found to be the most effective method of coping with peritoneal contamination. The tube is removed at the end of 36 hours. We do not concur with the view that a tube placed in the pelvis does not drain the peritoneal cavity. That such drainage is effective for a period of 24–36 hours is proved by the following observations.

FIG. 2.

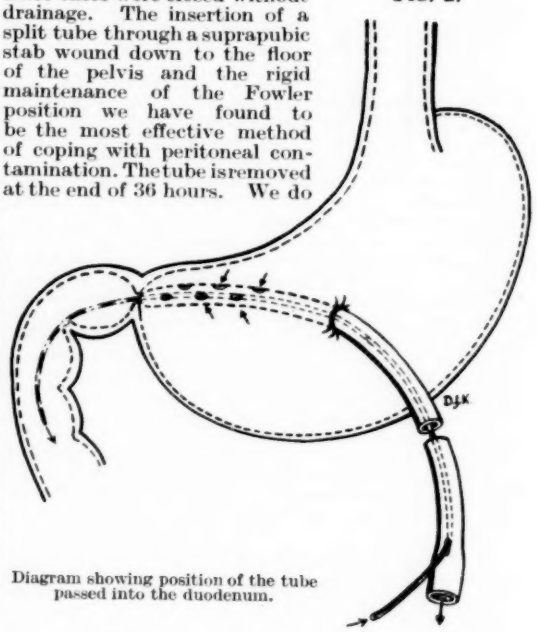


Diagram showing position of the tube passed into the duodenum.

In three successive cases of perforated peptic ulcer, after the tube had been inserted and just before stitching up the epigastric incision, 2 c.cm. of brilliant green was deposited in the peritoneal cavity at the side of the duodenum. The epigastric incision was closed in the usual way. Within a

few minutes, and before the patient had left the operating table, the dye made its appearance through the suprapubic tube. The dressing was changed four-hourly, and the amount of staining of the gauze and wool noted. The staining was more intense in the first three dressings, and steadily diminished in intensity up to 24 hours. Between 24 and 36 hours the staining was only faint.

It is evident that, for 36 hours at any rate, the peritoneal fluid percolates into the pelvic cavity, and is forced through the tube by the positive intraperitoneal pressure. The tube can be rapidly inserted in the following way. As soon as the perforation is closed, a large square swab is folded on itself four times; it is passed in the hollow of the left hand through the epigastric incision and applied to the peritoneum immediately above the symphysis pubis, taking care that there is no loop of intestine between the swab and the abdominal wall. A stab wound is made on to the swab. The hole in the peritoneum should be large enough to grip the tube firmly after it has been inserted. Instead of cutting down on to a swab one of us (C. H. W.) uses the head of a tablespoon on to the convex under surface of which two rings have been brazed to fit the index and middle fingers. The epigastric incision is closed without drainage.

The Double-tube Technique.

Where the ulcer is large and the surrounding induration extensive, the amount of infolding that is necessary to ensure closure of the perforation causes definite obstruction at the pylorus. This difficulty is overcome by means of a double tube (Fig. 1), which serves the dual purpose of draining the stomach promixal to the obstruction and introducing fluid into the duodenum beyond the obstruction. It is in effect a gastrostomy and an enterostomy. The outer tube is made of rubber similar to an ordinary catheter of about 22 Charrière. It is perforated with several holes for a distance of one and a half inches from the tip. There is a further oblique perforation at the side of the tube near the flange and a terminal one at the tip. This latter perforation is just large enough to admit a No. 8 ureteric catheter. The inner tube consists of a ureteric catheter, which is passed into the outer tube through the side hole near the flange and out through the terminal opening. The tip of the inner tube at the time of introduction should just present at the tip of the outer tube. The double tube is introduced through a small incision in the anterior wall of the stomach at a point about three inches from the pylorus. It is passed with the right hand and guided by palpation through the stomach wall with the left hand. When the outer tube abuts on the gastric side of the obstruction, the inner tube is pushed through the stenosis and guided on until its tip lies in the second part of the duodenum (Fig. 2). The perforated part of the outer tube thus lies in the pyloric part of the stomach and proximal to the obstruction. It is now fixed in the wall of the stomach after Stamm's method and brought out through the epigastric incision without kinking (Fig. 3).

The outer tube allows gas to escape, and any gastric contents that may come away are led into a bottle attached to the patient's dressing. The inner tube is used for introducing fluid into the duodenum by means of a record syringe, the needle of which is passed into the proximal end of this tube. Our practice is to give 40 c.cm. of glucose solution every half hour for the first twelve hours and then to diminish the quantity according to the needs of the patient. When not in use the tube is coiled up and fixed to the outside of the dressing with a safety-pin. The inner tube has usually served its purpose by the third day and can be removed, and the outer tube can be taken away any time after the sixth day.

The advantages of this procedure are obvious. 1. It provides a simple and effective way of administering much-needed fluid. 2. It drains the stomach and allows the escape of flatus, thus preventing the very distressing symptoms of gastric distension such as hiccough, nausea, and vomiting.

E. R. Schmidt[4] performs gastrostomy as a routine in all cases of perforation. We have not done this in any of our cases, but can testify to the amazingly smooth recovery of the cases in which we have employed gastric drainage as above described.

Gastro-jejunostomy at the Time of Suture.

On no aspect of the treatment of perforated peptic ulcer has there been more controversy than on the question of performing primary gastro-jejunostomy.

FIG. 3.

The tube emerging from the wall of the stomach.

Unfortunately, the statistics of the advocates of suture and gastro-jejunostomy are not comparable with those of surgeons who advise suture only. Gastro-jejunostomy is generally carried out in selected cases only, and the statistics of a series of such cases are therefore not comparable with a series when suture only has been done, for the latter would include the bad as well as the good operation risks. In many of our cases where, from the general condition of the patient and the duration and size of the perforation, the case would have been judged fit to withstand a gastro-jejunostomy, we have been impressed with the critical condition they have passed through (not accounted for by pyloric obstruction due to suture) before convalescence is established. We cannot but feel that in many of these cases the additional strain of a gastro-jejunostomy would have turned the scales against them.

More convincing than this clinical impression as to the inexpedience of primary gastro-jejunostomy is the evidence that it is not required in a large proportion of cases. C. E. Gibson[5] reports that only seven out of twenty-eight cases of perforated duodenal ulcer and one out of twenty-eight cases of perforated gastric ulcer required a second operation after suture alone had been carried out. E. H. Pool[6] writes that only one-third of the cases of simple suture develop later symptoms.

Mr. P. H. Mitchiner, of St. Thomas's Hospital, London, in a personal communication, gives figures of 69 cases operated on by him up to 1928. All of them were treated by simple suture without gastro-jejunostomy. In six only was there recurrence of symptoms requiring treatment by operation.

Our figures on this point are complicated by the fact that during the years 1923–26 we carried out delayed gastro-jejunostomy on all cases from six to eight weeks after simple suture. We felt then that an ulcer that was active enough to perforate was

sufficient indication for a gastro-jejunostomy. After following this practice for four years we began to realise that in a considerable number of the cases the duodenum and pyloric canal had made such perfect recovery and showed so little deviation from the normal that gastro-jejunostomy seemed unwarranted. We therefore abandoned this practice and now perform secondary operation in those cases only where, after a period of observation, the indications are clear. Of 58 cases managed on these lines we have had to perform secondary operations in ten, but as these are our most recent cases it is probable that this figure will have to be increased. In the main, the cases that are deemed fit for primary gastro-jejunostomy are those with small perforations and slight pathological changes in the adjacent tissues; these are the very cases that will not require it. On the other hand, there is a fair proportion of cases in which the perforation in the neighbourhood of the pylorus is so large and the surrounding induration and fibrosis so extensive that the perforation can only be closed with deep infolding. Immediate or remote stenosis is almost inevitable; these are the cases in which primary gastro-jejunostomy is most strongly indicated, but unfortunately they are the more serious cases and the ones that are least able to withstand the additional strain. The immediate ill-effects of pyloric obstruction can be avoided by adopting the double-tube technique described above. At a later date—any time after six weeks—a gastro-jejunostomy can be performed without appreciably increasing the death-rate. We have carried out delayed gastro-jejunostomy in 56 cases with one death, which was due to broncho-pneumonia. In operating on a case of perforation one should have no thought for the remote result. The immediate object is to save life. These cases are always ones of grave emergency and ones in which the immediate prognosis must be guarded. The additional strain of a gastro-jejunostomy, however dexterously it may be performed, is not justified. The remote result can always be improved by a clearly indicated subsequent operation.

Results.

The more obvious factors concerned in the mortality are the duration, the site, and the size of the perforation. It is noteworthy that we could not trace any relationship between the age of the patient and the prognosis (Table II.). The older patients

TABLE II.

Age in Q. G.	Total cases.	Duodenal.	Deaths.	Gastric.	Deaths.	Age in Q. G.	Total cases.	Duodenal.	Deaths.	Gastric.	Deaths.
Under 20	1	1	0	0	0	50–54	20	16	5	4	2
20–24	10	8	2	2	1	55–59	11	6	1	5	3
25–29	22	20	5	2	1	60–64	5	2	1	3	2
30–34	19	15	3	4	2	65–69	5	4	3	1	1
35–39	22	20	2	2	2						
40–44	20	15	0	5	3	—	158	124	26	34	21
45–49	23	17	4	6	4						

seem to do almost as well as the young. There are, however, other factors, the importance of which cannot be estimated at the time; the most important of these is the toxicity and type of infection of the intraperitoneal fluid. In our experience perforations of gastric ulcers are more fatal than duodenal perforations. This is due to the facts that gastric ulcer patients are in a lower state of health and the perforations are usually of larger size, with the result that there is more extensive flooding of the peritoneal cavity with toxic material. Furthermore, in five of the thirty-four gastric perforations the underlying condition was carcinoma. Table III. shows the immediate mortality in these cases of perforated gastric ulcer. It is arranged in groups of six-hourly periods, depending on the interval between perforation and operation.

The immediate cause of death in the twenty fatal cases was as follows:—

Shock of perforation and operation	7
General peritonitis and paralytic ileus	8
Broncho-pneumonia	1
Subphrenic abscess	1
Hæmorrhage	1
Empyema	1
Intestinal obstruction	1

The subsequent history of the 14 recoveries is as follows:—

3 have not required any further operative treatment.
3 have required posterior gastro-jejunostomy.
2 have required partial gastrectomy.

These eight cases have been examined recently and are completely satisfactory.

The remaining six cases have died from diseases as follows:—

2 from cancerous cachexia.
1 from myocardial degeneration.
1 from chronic interstitial nephritis.
1 from empyema following acute lobar pneumonia.
1 from broncho-pneumonia following operation for ventral hernia.

Table IV. shows the immediate mortality in 124 cases of perforated duodenal ulcer. It is arranged as in the gastric cases.

TABLE III.

Hours of perforation.	Total cases.	Recoveries.	Deaths.	Mortality per cent.
0– 6	12	8	4	33·3
6–12	12	6	6	50
12+	10	—	10	100
—	34	14	20	59

TABLE IV.

Hours of perforation.	Total cases.	Recoveries.	Deaths.	Mortality per cent.
0– 6	67	60	7	10·4
6–12	39	30	9	23
12–18	8	4	4	50
18+	10	4	6	60
—	124	98	26	20·96

The immediate cause of death in the 26 cases has been:—

General peritonitis and paralytic ileus	16
Shock of perforation and operation	3
Broncho-pneumonia	7

The subsequent history of the 98 cases has been as follows:—

41 have remained satisfactory without further operation.
53 have had posterior gastro-jejunostomy, of which 51 are satisfactory: the other two developed jejunal ulcers and required further surgical measures.

The above 94 cases have been examined recently and we have classified them as satisfactory on these grounds. The patient has a good appetite; has no pain and no vomiting; has little or no flatulence; his weight is stationary or has increased; bowels are regular; scars are healthy; general condition is good; and the patient is able to follow his usual occupation.

Four cases have died subsequently from diseases as follows:—

1 from an accident causing fractured base of the skull.
2 from pulmonary tuberculosis.
1 from broncho-pneumonia following posterior gastro-enterostomy.

Our thanks are due to Dr. R. T. Bailey, medical superintendent, Mill Road Infirmary, Liverpool, for the facilities he has afforded us in carrying out these investigations; also to Sisters L. Handley and E. Irving for the painstaking and efficient way in which they have helped us to follow up the cases.

References.

1. Guthrie, D.: New York State Jour. Med., xxiii., 66.
2. Rowlands, R. P., and Turner, P.: Operations of Surgery, London, 7th ed., vol. ii., p. 117.
3. Bruett, H.: Beitr. Z. klin. Chir., 1927, cxxxviii., 601.
4. Schmidt, E. R.: Acta Chirurg. Scand., 1922, lv., 314.
5. Gibson, C. E.: Jour. Med. Sci., 1923, clxv., 809.
6. Pool, E. H.: Ann. Surg., 1922, lxxvi., 475.

PARATHYROID TETANY AND CATARACT.

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THE association of cataract and muscular spasms has long been recognised, but only gradually have their connexion with an underlying parathyroid deficiency been shown. The results of extirpation of the parathyroids in animals and man have proved the constancy of this syndrome.

In 1906 Erdheim,[1] after removal of the parathyroid glands in rats, observed the onset of tetany, followed six months later by cataract. Hayano[2] also studied the eyes of young parathyroidectomised rats, and in almost all cases observed the appearance of lenticular opacities within a few days of operation. In 1915 Edmunds[3] described the development of cataracts in a parathyroidectomised dog. The animal had been kept alive for two years after operation, tetany being controlled by milk and intravenous calcium injections. The cataracts developed after 23 months. This was confirmed by Dragstedt, Sudan, and Phillips,[4] who discovered cataracts in six parathyroidectomised dogs in whom tetany was being controlled by doses of calcium lactate. These cataracts developed in from three to six months after operation, and progressed in some cases to complete opacity.

In human beings a number of cases of this combination following thyroidectomy have been described. In a review of the recorded cases in 1928, Jacques[5] has collected 31 cases from the German literature, one English case, and described two more. Others have been described by Sainton and Peron,[6] Aub,[7] and Hunter.[8] The following is an account of a further case.

History.

A married woman, aged 34, with three healthy children, first attended out-patients at Addenbrooke's Hospital on March 23rd, 1929. She complained of fits, tingling in the backs of the hands and in the feet, and attacks of dimness of vision.

One sister, aged 14, has a goitre, which was first noticed at the age of 12. One brother died of pulmonary tuberculosis.

History of Present Illness.—The patient was born in Norfolk, and lived there until she was 18. After this she spent periods in Buckinghamshire and Yorkshire, but for the last few years she had lived near Cambridge. At the age of 18 she first noticed a goitre. At 19 she had an operation for removal of glands from the side of her neck. The goitre gradually increased in size, and at the end of 1927 began to cause her great discomfort from pressure. This was especially marked when she lay down, and she then felt she was being choked.

In February, 1928, the pressure symptoms became so severe that partial thyroidectomy was performed. At the operation both lateral lobes of the thyroid gland appear to have been completely removed, while the middle lobe was left. Sections of the excised thyroid showed normal thyroid tissue. The vesicles were distended with colloid, but there was no evidence of hyperplasia.

Within a week of operation she found she could not use her hands properly on account of stiffness of the fingers. When she was drinking a cup of tea her hand would stop in the position in which the cup was held, and would sometimes remain fixed thus for ten minutes. The backs of the hands were intermittently tingling as if they were very cold; when, however, she put them into hot water this became worse. This sensation extended up as far as the middle of the forearm. The elbows were not affected. At the same time there was tingling of the same nature in the feet, but this was less marked, and the feet did not at that time become fixed. When the tingling sensation came on in the hands and feet and the hands became fixed the corners of the mouth seemed to be pulled sideways. The tongue "seemed to be cramped," so that she could only use it with difficulty to speak or eat, and swallowing was very difficult. The eyes or voice were not affected at that time.

These symptoms persisted with varying intensity until July, 1928. She was always unable to do any fine work such as knitting or writing, although she could do both these things well before operation. At times she had great difficulty in feeding herself because of the tendency of the hands to become fixed "because they used to go cramped the way I was holding anything." Within a few weeks of the operation cramp came on in the feet, and they used to become fixed in the position in which they were put for ten minutes. The toes were generally drawn downwards and plantar-flexed. This was never sufficiently severe to prevent her walking. At this time the eyesight was not affected, but on extreme deviation of the eyes to the right or left she sometimes had difficulty in bringing them back into the midline position.

In July, 1928, she had a fit. This came on suddenly, without any warning, in the shape of tingling or cramp in the hands or feet. She lost consciousness completely, and did not come round again for over an hour. Her husband described her as very blue during the early part of the fit, and foaming at the mouth. Spasms affected the hands and feet particularly. After this fit she could not see properly after she regained consciousness for almost an hour on account of a mist in front of her eyes. This dimness of vision then passed off completely. In July she had two other similar fits, in one of which she was unconscious for three hours. Each fit was followed by dimness of vision, which passed off after a few hours. She had no more fits after July until the following December. Then she began to have fits daily, at first in the morning when she woke up, but later she had two or three every day, and was liable to them at all times of the day. These continued until March 16th, 1929, and then stopped. In the intervals between the fits tingling of the backs of the hands, stiffness of the wrists and fingers, with complete inability to knit or sew or perform fine movements, stiffness of the tongue, and tingling and stiffness of the feet continued, sometimes worse, sometimes better. She could not associate the times of exacerbation and remission with any change in her diet or mode of life.

After the first few fits in December the mistiness of vision did not pass off so quickly, and gradually it became continuous, although worse after each fit. Between March 16th and 23rd she had no fits, but the other symptoms continued. Her eyesight did not improve.

Before her operation her periods had always been quite regular. Afterwards they were often irregular as regards time by a week, but were more scanty than before. In November, 1928, she had a miscarriage at two months. From November to March the periods became quite regular again.

On March 23rd she first attended out-patients at Addenbrooke's Hospital. Chvostek's sign was then very pronounced. Percussion over the various branches of the facial nerve at their outlet from the stylomastoid foramen caused twitching of the frontalis muscle as far as the middle of the forehead, of the muscles round the eye, the cheek, round the mouth, and between the corner of the mouth and the point of the chin. Trousseau's sign could not be obtained. She could see well enough to recognise people, and could read ¼ inch headlines with each eye from a distance of a few inches. The serum calcium was found to be 3·2 mm. per 100 c.cm. Accordingly she was ordered a pint and a half of milk and two eggs daily, and given calcium lactate 3 drachms daily.

On April 4th she was admitted as an in-patient. After three days on the above régime her tetanic symptoms became very slight, and she was left with only an occasional tingling feeling in the back of the hands. Her eyesight, however, grew rapidly worse, and on the day of admission she complained that she was almost completely blind.

Physical Signs.

The patient was a robust, healthy-looking woman, with a slow placid manner. Height, 5 ft. 6 in.; weight, 9 st. 1 lb. Intelligence and memory good. Mucous membranes normal in appearance. Hair normal in all parts of the body. Skin normal. Finger- and toe-nails normal. Calcification of the teeth apparently rather above the average, and no caries present (Mr. H. Curtis). The larynx showed no abnormality. Voice and hearing normal. No abnormality found in the central nervous system.

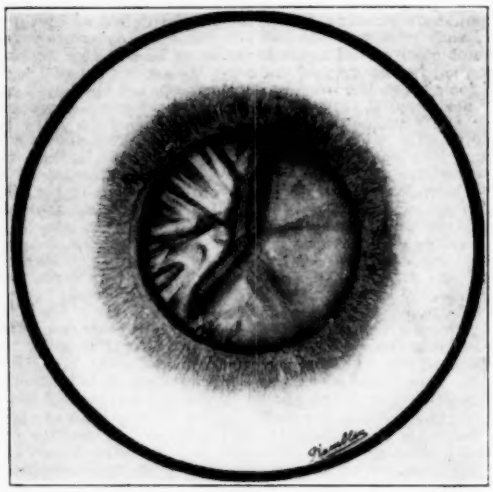
Eyes.—Discs could not be seen on account of the cataract. The patient complained of a white mist in front of the eyes, and both right and left eye could detect movement of the hand at one foot. On examination with the slit-lamp Mr. Arthur Cooke reported: "Both lenses show fairly generalised cataract, both central and nuclear, laid down in large pyramidal masses, with bases towards the periphery. These are of no great density, but enough to obscure the red reflex without obliterating it entirely." (See Fig. 1.)

In the *neck* the incisions for thyroidectomy had left an extensive collar scar 6 in. long. A mass of thyroid tissue the size of a golf ball was palpable directly in front of the trachea. No remnants of the lateral lobes could be palpated.

Chvostek's sign was positive. Light percussion over the branches of the facial nerve below the ear

caused twitching of the corners of the mouth. The twitching of other parts of the face observed in outpatients ten days before had disappeared. Trousseau's sign was completely negative. Inflation of a sphygmomanometer bag around the upper arm for a period

FIG. 1.



Slit-lamp drawing of cataract in the left eye. The changes in the right eye were of equal intensity.

of five minutes produced no abnormal sensations or spasm of hand.

Examination of the heart, lungs, abdomen, and urine was negative. The blood pressure was 115/75, and there was no arterial thickenings or tortuosity.

Other examinations gave the following results:—

Galactose tolerance test: Within normal limits.
Renal efficiency tests: Kidneys efficient.
Wassermann reaction: Negative.
Basal metabolic rate: −2·5 per cent.
Carbon dioxide combining power of the blood: 62 c.cm. per 100 c.cm. serum.
Serum calcium*: 6·2 mg.
Inorganic phosphate in serum (April 9th), 6·9 mg.

Controlled X rays showed no evidence of abnormal calcification in the bones or teeth.

Progress of the Case.

The effects of treatment with parathyroid extract and calcium are shown diagrammatically in Fig. 2. When it was desired to give a calcium-rich diet two pints of milk and two eggs were given, with additional calcium lactate daily. When it was desired to give a calcium-low diet milk and eggs were withdrawn, and the calcium lactate stopped. Collip's[9] parathormone was given by intramuscular injection in doses of 10, 20, or 30 units twice a day, and for one period this was replaced by a well-known brand of dried parathyroid extract by the mouth in doses of gr. 1/5 t.d.s. (equivalent to grs. 6 of the fresh gland per day).

An attempt is also made in Fig. 2 to show the correlation between the intensity of Chvostek's sign with the changes in the blood and the parathyroid and calcium dosage. It was found to be easy to differentiate three definite degrees of intensity of twitch which are represented as follows:—

0. Base line: No twitch at all.
1. Twitching at the angle of the mouth only.
2. Twitching at the angle of the mouth and the outer canthus of the eye.
3. Twitching also of the muscles between the angle of the mouth and the point of the chin, of the muscles of the cheek between the mouth and the eye, of the muscles round the eye, and of the muscles above the eyebrow as far forward as the midline of the forehead.

In this case the relationship between the degree of twitch and the serum calcium seemed to be approximately as follows:—

Serum calcium below 5 mg. per 100 c.cm.: third degree of twitch.
Between 5 and 7 mg.: second degree.
Between 7 and 9 mg.: first degree.
Above 9 mg.: Chvostek's sign negative.
Trousseau's sign was always negative.

With one exception the only symptoms, apart from blindness complained of during treatment, were tingling of the backs of the hands, and, to a lesser extent, of the feet, and stiffness of the fingers. These symptoms only persisted for three days at the commencement of the high calcium diet from April 25th to 28th (the serum calcium on the 28th was 3·2 mg.), and did not return again until the serum calcium fell to below 5 mg., when they appeared for a few days intermittently. For the remainder of the time they were absent.

The one exception was on the day following the day on which the left cataract was needled. Following the operation the patient felt sick and was unable to take any food or calcium lactate. After 24 hours she developed a typical attack of tetany, with hands fixed in the accoucheur position. The feet also were affected to a slighter degree. Calcium lactate was then given by the mouth, and the spasm and tingling gradually passed off. This was the only occasion while she was under observation in hospital on which both parathyroid and calcium were omitted at the same time, and also the only occasion on which she developed true tetany.

After 13 weeks in hospital this patient returned home. She is at present taking 12 drachms of calcium lactate daily, with two pints of milk and two eggs and no parathormone. On this her serum calcium keeps between 5 and 8 mg., she gets occasional attacks of numbness in the hands and feet, but since discharge has had no actual attack of tetany. Chvostek's sign is positive to the first or second degree. The cataracts are being treated surgically by Mr. Arthur Cooke.

Discussion.

An analysis of the 38 recorded cases shows that the results of partial or complete removal of the parathyroid glands may for convenience be divided into two categories: (1) alterations in the calcium and phosphate content of the serum associated with signs and symptoms of tetany; (2) changes in the lenses, nails, teeth, and hair.

Tetany.—In the present case the correlation between the serum calcium and the various manifestations of tetany are again clearly shown. Bauer and Ropes[11] have emphasised the value of calcium lactate ingestion alone in raising the serum calcium in normal subjects. In this case a high calcium diet and calcium lactate, although they had a marked effect in raising the serum calcium and controlling tetany, would not bring it to its usual level unless combined with Collip's parathormone.

In view of the claims for dried parathyroid extract given by the mouth, the effects in this case are interesting:—

Parathormone and a high calcium diet raised the serum calcium from 6·2 to 9·2 mg. in five days, causing Chvostek's sign to disappear, and maintained the calcium at about that level for the next week (dose 20, rising to 40 units daily). The dried parathyroid extract (gr. 1/5 t.d.s.), given for ten days with the identical calcium diet, was associated with a fall in the serum calcium from 6 mg. to 4·6 mg., a return of Chvostek's sign to the third degree, and a return of slight symptoms of tetany.

The clinical manifestations of tetany in this case are typical, except in one particular. Trousseau's sign was always negative, however low the serum

* All serum calcium and phosphate estimations were done twice and the technique was controlled by frequent estimations on normal serum.

calcium and however marked the other symptoms and signs of tetany. Inflation of the sphygmomanometer bag around the upper arm for five minutes did not cause the slightest tendency to spasm in the fingers on any occasion.

A clinical feature of special interest in Aub's case was the association of asthma and tetany. This patient had had two operations for moderately severe exophthalmic goitre in 1917, and for several years after this had severe attacks of asthma and tetany. These continued until treatment with Collip's parathormone raised the serum calcium to 7 mg., when both asthma and tetany ceased.

The significance of changes in the serum phosphates in parathyroid tetany are not well understood. Gates and Grant,[12] working with parathyroidectomised rabbits, found that a rise in the inorganic phosphorus occurred in some rabbits which did not develop tetany but that it was never absent in those that did, and was apparently associated with the onset of an acute attack. The average Ca/P. (calcium to phosphorus) ratio in normal rabbits was 1·9. In those animals

FIG. 2.

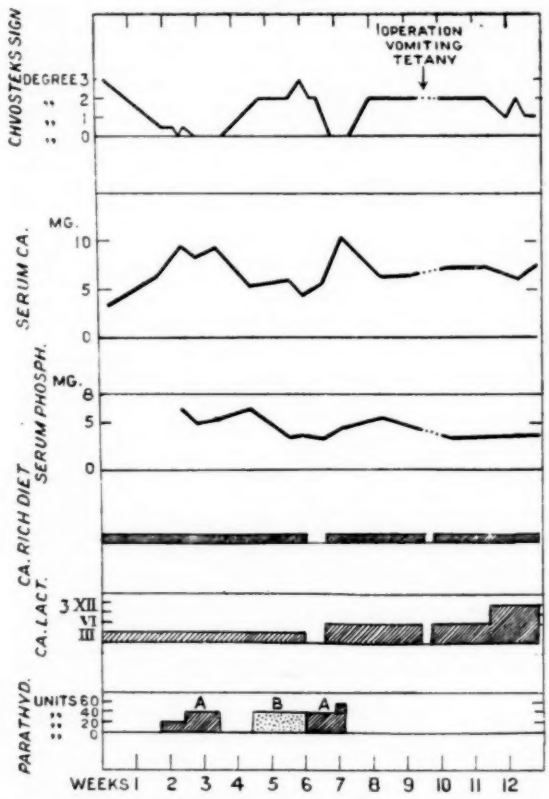


Chart showing variations in Chvostek's sign, serum calcium and serum phosphates during treatment with a calcium-rich diet, calcium lactate, and two kinds of parathyroid extract (A and B). A = Collip. B = Dried extract by mouth.

that developed acute tetany after parathyroidectomy this ratio was changed, not only by a fall in the serum calcium, but also by a rise in the phosphates, so that the ratio was then usually below unity. Greenwald[13] has stated that in over 50 parathyroidectomised dogs tetany never appeared without phosphorus retention, and conversely a drop in phosphorus excretion was only observed in one dog in ten that did not develop tetany. Salvesen[14] found that the inorganic phosphorus of the blood-serum of completely parathyroidectomised dogs was considerably increased and tended to remain above the normal value. Salvesen, Hastings, and McIntosh[15] conclude that a fall in blood calcium is the significant factor in the development of tetany. In human beings with parathyroid tetany most recorded readings of the blood phosphates are slightly above normal. This is so in the present case. Variations in the serum phosphates, however, do not appear in this case to have any very close relationship to the degree of excitability of the muscles, whereas the relationship between the serum calcium readings and the intensity of tetanic manifestations is very close indeed. Albright and Ellsworth [16] have lately published some investigations on a case of idiopathic hypoparathyroidism in a boy of 14. They base their diagnosis on the following criteria: low serum calcium, high serum phosphorus, cataract, normal density of the bones by X ray and tetany aggravated by exertion. In this case the injection of Collip's parathormone in a dose of 50 units daily for four days caused an immediate increase in phosphorus excretion, reaching its maximum within two hours, an increase in the serum calcium, an increase in calcium excretion, and a decrease in the serum phosphorus. They bring forward evidence to show that the three latter effects are sequelæ of the increased phosphorus excretion caused in some way by parathyroid hormone.

Changes in the lenses, nails, teeth, and hair.—In an analysis of the 34 cases of cataract after thyroidectomy quoted by Jacques and the four additional cases referred to here, changes of the hair and nails were present in eight and changes of the hair only in three more. In the case described by Sainton and Peron, during the two years following operation, the hair and nails fell out, and the teeth decayed rapidly.

Two years after operation the patient was bald but for a few dozen dry brittle hairs, and was obliged to wear a wig. The nails were extremely brittle, the tint of old ivory in colour, and the normal striation was accentuated. These changes were accompanied by typical severe attacks of tetany and the development of bilateral cataracts. The authors comment on the fact that their patient showed no sign of myxœdema, although the greater part of the thyroid gland had been removed at operation. One year later the hair had grown again and the nails had become normal in appearance without any systematic treatment.

Jacques, in one of his cases, also describes a similar condition. About three months after operation a rapidly developing alopecia came on and the nails became friable. The teeth, however, showed no abnormality. On large doses of calcium lactate the hair grew again and the slight nail changes disappeared. This patient also showed no signs of myxœdema and the basal metabolic rate was + 3 per cent.

No satisfactory explanation has yet been put forward to account for these changes, and in the absence of more complete knowledge discussion is idle. One fact, however, is worth noticing in the present case, and that was the very rapid increase in the lens opacity which followed an increased calcium diet without parathormone. In two weeks vision practically disappeared in both eyes, while at the same time the tetanic symptoms disappeared. This observation would appear to support Greenwald's [17] evidence that in the absence of the parathyroid hormone there is an extensive deposit of calcium, probably in the form of calcium phosphate, in the tissues, and that the cataracts observed after parathyroidectomy may be due to a deposition of this salt in the lens. As a precautionary measure it seems to be unwise in severe parathyroid tetany, before cataracts have developed, to give an increased calcium diet without parathormone.

There appears to be no equality of effect in the structures affected. For example, in this case, although the serum calcium was extremely low and the tetany and cataracts very severe, the teeth were well calcified, and there were no changes whatever in the hair or nails.

Prevention.—If sufficient care is taken in operations on the thyroid gland extensive damage to the parathyroids should never occur. The rarity of such an

event in England is probably due to the fact that thyroid operations are on the whole less extensive than they are abroad, and that most English surgeons make a point of leaving the upper posterior part of at least one lobe. In the case quoted here both lateral lobes seem to have been completely removed and only the middle lobe left behind. In America elaborate care is taken to prevent this accident occurring. In a review of 6700 goitre operations Lahey[18] mentions the fact that parathyroid tetany only occurred in three cases. This he attributes to the fact that at the time of removal all thyroid tissue was carefully examined for parathyroid bodies. If these were found and the findings confirmed microscopically they were at once grafted into the belly of the left sternomastoid muscle. That this technique produced a living graft was confirmed experimentally in dogs by R. B. Cattell and R. L. Mason.

Prognosis.—In this case treatment with parathormone appeared to have no effect on the cataract. This agrees with Jacques's observation on his second case, in which the cataracts continued to progress in spite of treatment with parathormone for eight weeks. Prognosis as regards sight apparently depends on successful surgical removal of the cataracts. There seems to be no reason why this should not be accomplished.

With regard to the tetany a high calcium diet and 12 drachms of calcium lactate daily keep the serum calcium between 5 and 8 mg., and the signs within the limits of a latent tetany. With parathormone as an additional weapon there seems to be no reason why the tetany should not remain completely controlled. At present, while the patient is blind, it is difficult to estimate her power of performing prolonged fine movements, such as knitting or writing. It may prove necessary to give parathormone regularly in the same way that insulin is given in diabetes.

In conclusion I should like to thank Dr. G. S. Haynes for permission to investigate and treat this case as an in-patient, Dr. C. E. G. Wolf and Dr. W. M. Wright for the laborious biochemical investigations they have carried out, Mr. Arthur Cooke for his examination of the eyes, Dr. Ffrangcon Roberts for the radiological examinations, and Dr. W. J. Young for the early history of the case.

References.

1. Erdheim, J.: Mitteil. a. d. Grenzgeb. de. Med. u. Chir., 1906, xvi., 632.
2. Hayano, R.: Quoted by Jacques.
3. Edmunds, W.: Proc. Roy. Soc. Med. (Ophthal. Sect.), 1915, ix., 53.
4. Dragstedt, L. R., Sudan, A. C., and Phillips, K.: Amer. Jour. Phys., 1924, lxix., 477.
5. Jacques, L.: Amer. Jour. Med. Sci., 1928, clxxv., 185.
6. Sainton, P. and Peron, N.: Rev. Neurol., 1922, xxix., 442.
7. Aub, J. C.: Boston Med. and Surg. Jour., 1926, cxciv., 844.
8. Hunter, D.: Proc. Roy. Soc. Med. (Clin. Sect.), 1928, xxi., 95.
9. Collip, J. B.: Jour. Biol. Chem., 1925, lxiii., 395.
10. ,, : Jour. Amer. Med. Assoc., 1927, lxxxviii., 565.
11. Bauer, W., and Ropes, M. W.: Ibid., 1926, lxxxvii., 1902.
12. Gates, F. L., and Grant, J. H. B.: Jour. Exp. Med., 1927, xlv., 121.
13. Greenwald, I.: Jour. Biol. Chem., 1924, lxi., 33.
14. Salvesen, H. A.: Ibid., 1923, lvi., 443.
15. Salvesen, H. A., Hastings, A. B., and McIntosh, J. F.: Ibid., 1924, lx., 311.
16. Albright, F., and Ellsworth, R.: Jour. Clin. Invest., 1929, vii., 183.
17. Greenwald, I.: Amer. Jour. Physiol, 1926, lxvii., 1.
18. Lahey, F. H: New Eng. Jour. Med., 1929, cc., 909.

A HOSPITAL FOR THE MIDDLE CLASSES.—The Merseyside Hospitals Council (Liverpool) is preparing a scheme for hospital and medical treatment of salaried workers and members of the middle-class generally.

THIRSK LAMBERT MEMORIAL HOSPITAL.—The annual report for the year ended Sept. 30th last shows that the daily cost per head of the 121 in-patients was 7*s.* 2*d.*, as compared with 10*s.* 2*d.* in the preceding year.

TREATMENT OF
PUERPERAL SEPTICÆMIA BY SERUM.

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THIS paper deals with the treatment of cases of puerperal septicæmia by concentrated scarlet fever antitoxic serum. Twenty-seven cases have been treated and eight of these have died—a mortality of 29·6 per cent.

Argument.

Theoretically, two conditions should be satisfied for the successful treatment of a given disease by a serum: the first is that the disease be in a strict sense due to a single infective agent, the second that the remedy contain the corresponding specific antibodies.

It has been confirmed by Armstrong and the author[1] that the great majority of cases of severe puerperal sepsis are due to the well-known hæmolytic organism *Streptococcus pyogenes*. We have suggested that the term "puerperal fever" be restricted to cases due to this streptococcus, for severe and fatal cases are caused almost exclusively by this organism. Further, we advocate that the diagnosis of puerperal fever should be based always on a bacteriological test and in consequence every case treated by serum in the series described in this paper has been proven due to *S. pyogenes* by cultures from the cervix uteri and the blood.

The term "serological identity," as applied to bacterial strains, entails specificity of a very high degree. The identity of all strains of *S. pyogenes* has not yet been determined, but it is certain that several serological groups of this organism occur and that, just as in the case of the pneumococcus, still other virulent strains, not included in these groups, sometimes cause serious illness. The first condition or postulate—namely, that the disease be due to a single cause—would remain unsatisfied, therefore, were it not for the fact that there is evidence that the exotoxins from all strains of *S. pyogenes*, including strains responsible for scarlet fever, erysipelas, surgical sepsis, puerperal sepsis, are very similar if not identical, the toxin from scarlatinal strains being considered the most poisonous and antigenically most efficient. The treatment of diseases due to *S. pyogenes* by scarlatinal antitoxic serum may perhaps be compared with the serum treatment of diphtheria, for there are several serological races of *B. diphtheriæ* but probably a common toxin.

Published Results of Treatment by Scarlatinal Antitoxin.

No published account has been found at the time of writing of treatment of puerperal fever by scarlatinal antitoxic serum although there are numerous references in the literature to the treatment, with varying success, of small groups of cases by other antistreptococcal sera. (Marmorek 1895,[2] Van der Velde 1904,[3] P. F. Williams 1921,[4] H. Bailey 1924,[5] &c.) Antiscarlatinal serum has been extensively used in the treatment and passive prophylaxis of scarlet fever and also in the treatment of erysipelas. It is not possible within the scope of this paper to do more than summarise these results.

O'Brien,[6] in 1927, thus summarised the action of the serum in scarlet fever. "Concentrated scarlet fever antitoxin is of use in the treatment of scarlet fever. No antitoxin or other serum at present available has any direct action on septic complications. The early use of serum probably reduces the length of stay in hospital, but many further observations are required."

Parish and Okell,[7] who are primarily responsible for the preparation of the serum used in the cases

described below, found experimentally: (1) That acute and rapidly fatal septicæmia in rabbits due to hæmolytic streptococci obtained from cases of follicular tonsillitis, puerperal fever, cellulitis, &c., could be converted by administration of antitoxin into a subacute and relatively benign infection. (2) That the late complication of arthritis in rabbits was uninfluenced by the injection of serum, even in large doses.

It seems that there is a general impression in favour of the use of antitoxic serum in the treatment of scarlet fever, but both experimental and clinical evidence appear to lead to the conclusion that the later "septic" manifestations are uninfluenced. A similar criticism applies to erysipelas.

Apart from the cases to be described, I consider that the most suggestive and reassuring results have followed the use of the serum by my colleagues in severe surgical sepsis, including acute mastoid disease. It is evidence from these cases, rather than from the treatment of diseases predominantly due to streptococcal exotoxin, which has most encouraged me to persevere, for the clinical aspect of puerperal fever is essentially that of a bacterial invasion rather than a toxæmia.

Emphasis is laid on the fact that the serum used in the cases described here is antitoxic. If the results appear less satisfactory than in the corresponding treatment of diphtheria, it is suggested that the possibilities for serum treatment in severe puerperal sepsis are by no means exhausted. Better success may yet be obtained by using a serum rich in antibacterial, as contrasted with antitoxic, antibodies or a combination of both elements, although attempts so far to prepare such a serum have proved unsuccessful. In any event, it will be shown that large doses of serum may be given safely even in the severest cases of puerperal fever, and often with very striking results.

Method.

In order to test for serum-sensitiveness, 0·1 c.cm. of the serum was administered intradermally half an hour before the main dose. In no case did any reaction occur. This procedure was therefore discontinued after the first 13 cases. Serum in bulk was administered to the first 13 cases intramuscularly, in every subsequent case intravenous injection was exclusively performed. The maximum quantity administered by the intramuscular route on any one occasion did not exceed 30 c.cm. The maximum intravenous dose was 100 c.cm. and never less than 20 c.cm. Injections of serum were repeated as seemed desirable; there did not appear any limit to the number of doses which could be administered to the patient, but the greatest number given was four injections. Serum was given at intervals of not less than 24 hours. Treatment was determined by the patient's needs; a rigor in particular served as an indication for treatment or prolonged high fever with a rapid pulse.

Technique of Administration.

It is unnecessary to give details of the intramuscular method of administration for this has been discarded. Intravenous injection is performed with the customary aseptic precautions.

The apparatus consists of a conical funnel to which is attached a rubber tube two feet long carrying a short needle of wide bore. The patient's arm is exposed; an attendant clasps the upper arm or a bandage may be applied to congest the median basilic vein. The serum is diluted with an equal volume of physiologically normal salt solution and the container immersed in warm water to raise the temperature of the diluted serum to body temperature. The diluted serum is run in slowly; 20 minutes should be allowed for giving 200 c.cm. The puncture may be sealed conveniently by a collodion gauze. The vein should be practically undamaged and is used for future injections.

Reaction of the Patient.

The patient visibly reacts within half an hour to intravenous inoculation; the absence of some reaction is exceptional. In severe cases she shivers violently, her temperature rapidly rises, and may reach 105° F. or even 107° in 15 minutes with great acceleration of the pulse. The women complain of feeling very ill and of faintness. They sweat profusely but, notwithstanding, they are palpably hot to the touch. In two cases there was marked dyspnœa resembling asthma and in one hyperpyrexia was accompanied by a transitory delirium. These symptoms are to be attributed to the immediate effects of the administration of foreign protein and are proportional to the dose. The severe reaction lasts about half an hour and in favourable cases the temperature then falls, often becoming subnormal, with corresponding improvement in the general state.

It is of the most urgent importance that a hypodermic syringe charged with liquor adrenalin hydrochlor. B.P. strength 1 : 1000 be prepared before the serum is given, ready for immediate use if dyspnœa should develop. In such circumstances a dose of 10—15 minims is given subcutaneously without loss of time. Two only of the 14 cases treated by intravenous injection became dyspnœic and were given adrenalin, as a result of which the attack passed off.

The reaction following intravenous administration of serum may be very severe, therefore, but in no case has a fatal result been attributed to it. In any event it will be understood that the women were already seriously ill when treated. Serum rashes of urticarial type developed between the eighth and tenth day after treatment in two cases but without joint involvement.

Response to Treatment.

In favourable cases there are signs of improvement within 6 to 12 hours of treatment, judged by fall of temperature and diminished pulse-rate. The patient often declares herself better for the serum and clinically her aspect improves. This improvement may persist and lead on to recovery and the illness, in cases treated early, appeared actually to be cut short by the serum. Alternatively, improvement may be temporary only and in severe cases the temperature rapidly rises again.

Further administration of serum is usually followed by a favourable response, but the cases which proved fatal were but slightly influenced or not at all, and in one the severity of the rigors which marked the illness appeared to be exaggerated. The character of the response in each type of case is illustrated in representative charts.

Details of Treatment of Puerperal Septicæmia by Intravenous Inoculation of Scarlatinal Antitoxic Serum.

No.	Day of puerperium. Treatment—Begun.	Ended.	Injections.	Vol. of serum.	Day of R. or D.	Result.
				c.cm.		
1	4	8	3	250	8	R.
2	2	16	3	90	17	R.
3	5	15	4	80	16	R.
4	7	20	3	150	18	R.
5	6	8	2	40	9	R.
6	7	7	1	50	8	R.
7	5	7	2	150	8	R.
8	5	7	2	100	8	R.
9	5	16	4	100	17	R.
10	12	15	3	170	22	R.
11	19	19	1	100	20	D.
12	4	6	2	150	7	D.
	Day after abortion.					
13	6	9	2	130	22	D.
14	6	9	4	210	15	D.

R. = recovery; D. = death.

Details of Cases.

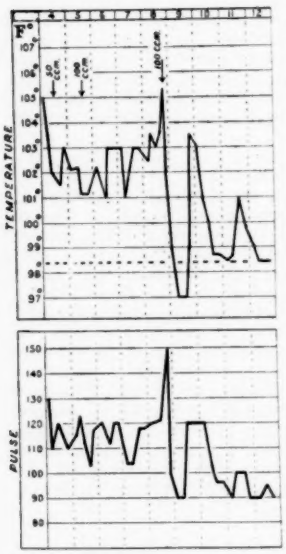
Twenty-seven cases have been treated with eight deaths, a mortality of 29·6 per cent. The details and results of the 14 cases treated by intravenous inoculation are here tabulated.

The following three cases, one of them fatal, have been selected to illustrate the effect of serum on the temperature and pulse-rate.

CASE 1 (Fig. 1).—Primigravida, aged 24, delivered at home. Labour normal, two vaginal examinations made. Rigor two days after delivery, temperature rose to 102° F. Admitted to hospital on fourth day of puerperium. Delirious on admission, temperature 105° F., pulse 130. Uterus involuting normally, lochia scanty. *Streptococcus pyogenes* grown in pure culture from the cervix uteri and the blood. 50 c.cm. of serum given intravenously on the fourth day without effect; 100 c.cm. on fifth day without effect; 100 c.cm. on eighth day followed within two hours by a fall of temperature and pulse-rate, the patient becoming rational for the first time since admission. Recovery rapid and uninterrupted, except for a rise in temperature on the following day.

CASE 2 (Fig. 2).—Primigravida, aged 19, delivered in hospital, vertex presentation, labour lasted nine hours. A sore on the patient's hand, from which *S. pyogenes* was recovered, was believed to be the source of infection. Temperature rose to 104° F. the day after delivery. Blood culture on the third day of the puerperium showed pure growth of *S. pyogenes*. 30 c.cm. of serum given on fourth day followed by a gradual fall of temperature and pulse-rate and improved general condition. Temperature 104° F. on ninth day, 30 c.cm. of serum given, and the temperature fell. Temperature again rose sixteenth day but blood culture negative, 30 c.cm. of serum given on this day; the puerperium subsequently normal.

FIG. 1.



CASE 1.—Temperature chart from the fourth to the twelfth days of the puerperium, showing response to an injection of 50 c.cm. serum and two injections of 100 c.cm.

CASE 3 (Fig. 3).—Multipara 3, aged 27. Threatened abortion at third month with hæmorrhage uncontrolled by drugs: admitted to hospital, uterus evacuated. Four days later temperature rose to 104° F. 30 c.cm. serum given on third day of fever, followed by a temporary fall in temperature and pulse frequency. 100 c.cm. serum given on sixth day of fever, again a temporary fall in temperature and pulse. No further serum given; death on twentieth day of disease. A metastatic broncho-pneumonia developed. *S. pyogenes* isolated from blood and uterus on third, sixth, and eleventh days of the disease. Serum treatment was perhaps insufficiently pressed in this case.

Bacteriology.

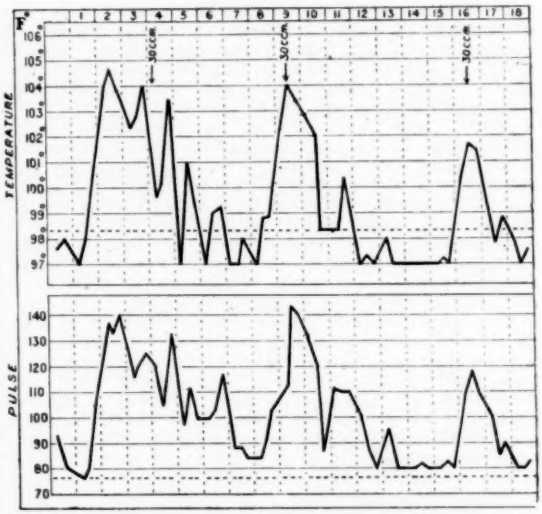
A blood culture and cultivations from swabs from the uterus were made in every case so soon as observation began, usually just prior to administration of serum. In every case typical *S. pyogenes hæmolyticus* was recovered from both sources. In six cases an attempt was made to estimate the number of streptococci present in the patient's blood. Half a cubic centimetre of the freshly drawn blood was spread over the surface of a blood-agar plate kept in readiness by the bedside. Quantitative blood cultures were made day by day in three cases which recovered and the number of organisms per c.cm. of blood was found to diminish as the patient's condition improved. One fatal case showed 75 colonies per c.cm. on the third day of the disease and on the seventh day 150 colonies per c.cm. In a second fatal case 100 colonies per c.cm. were grown on the fourth day. With increasing experience it may be possible in future to base a prognosis on the severity of the blood infection and so establish a standard by which the results of special treatment may be estimated.

The number of observations made was small, and it has not been possible as yet to compare the bacteriological technique used with other recognised quantitative methods of blood culture.

Discussion.

The importance of advancing the treatment of puerperal septicæmia is great and justifies publication of a relatively small number of cases at this early

FIG. 2.



CASE 2.—Temperature chart from the day of delivery to the eighteenth day of the puerperium, showing response to three injections of 30 c.cm. of serum.

stage. I believe that the patients are definitely the better for scarlatinal antitoxic serum, but recognise that other methods of treatment have raised similar hopes in the minds of those who have used them. It seems that, to be successful, treatment should be begun at the earliest possible moment, and furthermore that persistence in the treatment is essential. It is perhaps permissible to state that courage is required in the application of the remedy for the patients are often desperately ill, and the immediate result of intravenous injection of the concentrated serum is at times very severe.

Results claimed for any specific serum are always open to the criticism that "protein-shock" is responsible for the effects produced rather than the neutralising action of specific protective substances. In this connexion it would have been instructive to have treated similar cases by concentrated horse serum—that is to say, by administration of the "vehicle" without the "remedy"; this procedure is contemplated.

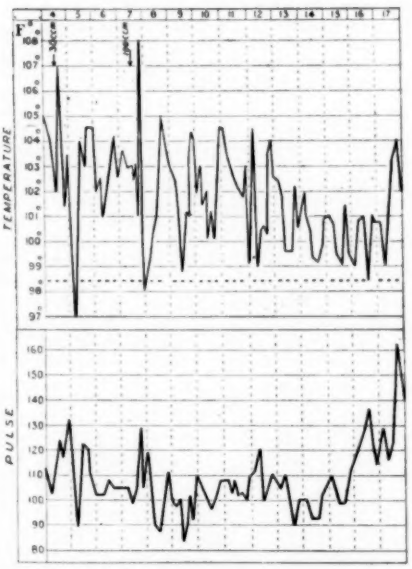
Not the least of the difficulties in estimating the value of the special treatment of sporadic diseases such as puerperal fever is the small number of cases available at any one time and in any one place. Statistics of the mortality from puerperal septicæmia are to be found in two reports,[3] presented to the British Congress of Obstetrics and Gynæcology in 1925, respectively by a London Committee on the prognosis and treatment of puerperal sepsis and a committee of the North of England Society for Obstetrics and Gynæcology on puerperal blood infections. Rules were made and observed by both committees by which cases should be judged suitable to be recorded as blood infections.

The London committee studied 247 cases, amongst which the mortality was 36 per cent. Of these, 53 cases were definitely proven to have streptococci in the blood; the exact variety of streptococcus was not stated. The mortality in this group was 66 per cent. The Northern committee studied 154 cases; the mortality-rate was 76 per cent. The blood was examined during life in 75 of these cases

and streptococci grown in over 65 per cent.; the mortality in this group was not stated. In 22 cases of which full particulars were available and were tabulated, 19 died, all with positive blood cultures; the three survivors showed negative blood cultures.

With regard to special treatment, the London committee report 33 cases conforming to the rules, treated by antistreptococcal serum and injections of quinine and a mortality of 18 per cent. Eleven patients were treated by intramuscular injections of quinine alone and all recovered; 14 patients were treated with antidiphtheritic serum and only one died; three patients treated by neosalvarsan and collosal iodine all died. The Northern committee report 101 cases treated by antistreptococcal serum and give an analysis of the quantities and details of administration of the serum. One hundred and four cases treated by antistreptococcal and other sera, on which operations were also performed, showed a mortality of 72 per cent., and 47 cases treated by serum, on which no operation was performed, a mortality of 76·5 per cent. In view of these widely varying results, no safe conclusions can be drawn from the results recorded in this paper—namely, 27 cases treated and a mortality of 29·6 per cent. Bright hopes may have been founded on the total recovery of the 11 cases mentioned above, treated by intramuscular injection of quinine, or on the 14 cases with only one death treated by antidiphtheritic serum, yet neither method has become generally established. Far-reaching experience coupled with the most rigid impartiality must indeed be exercised in assessing the value of special treatment. The conclusion seems forced that in the absence of a method of accurate estimation of the severity of a given case of puerperal septicæmia the existing statistics are of doubtful significance.

FIG. 3.



CASE 3.—Temperature chart from a fatal case of septicæmia following abortion. Two injections of serum, of 30 c.cm. and 100 c.cm., were given.

My thanks are due to the Wellcome Physiological Research Laboratory for the generous gift of serum and for cordial interest. I am indebted to the Staff of the Obstetrical Department of St. Bartholomew's Hospital and to my colleagues at the City of London Maternity Hospital for cases, and to Dr. R. R. Armstrong for help in drafting this paper.

Since completing this paper I have treated three cases, in all, of puerperal septicæmia with the same serum and all proved fatal. I also have had four cases of severe infections with organisms other than *S. pyogenes*, all of which responded to treatment with this serum. Doubt therefore exists whether the serum acts specifically or not.

References.

1. Armstrong, R. R., and Burt-White, H.: Brit. Med. Jour., 1929, i., 592.
2. Marmorek: Ann. de l'Inst. Pasteur, 1895, ix., 593.
3. Velde, van der, and Peham: Arch. f. Gynäk., 1904.
4. Williams, P. F.: Amer. Inst. Obst. and Gyn., 1922, iv., 636.
5. Bailey, H.: Amer. Inst. Obst. and Gyn., 1924, vii., 658, and 1924, viii., 7.
6. O'Brien, R. A.: Proc. Roy. Soc. Med., 1927, xx., 163.
7. Parish, H. J., and Okell, C. C.: THE LANCET, 1927, i., 71.
8. Report on Fifth British Congress of Obst. and Gyn., Brit. Med. Jour., 1925, i., 779.

NOTES ON THE TREATMENT OF GONORRHŒA IN THE MALE.

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GONORRHŒA restricted to the anterior urethra is a trivial complaint. Its importance rapidly increases as infection spreads and the posterior urethra and contiguous parts are successively involved.

Our first care is to support the patient's immunological defences by regulating personal habits and activities, and by rendering the urine at once less irritating and less favourable to the multiplication of gonococci by dilution and alkalisation. Local measures will aim at destroying germs and controlling inflammation without injury to the urethral lining.

It is questionable if the dietary restrictions commonly imposed are of much practical value. The withdrawal of meat, tea, coffee, ordinary condiments—and tobacco—is sufficiently a deprivation to cancel any theoretical gain, and excellent advice about rest and the speculative advantages of a milk diet chiefly adds to the characteristic mental depression of the patient. Competitive games, dancing, and equitation should be given up, sexual excitement is to be avoided, and alcoholic beverages, ginger ale, ginger beer, and cider are definitely harmful.

The ideal antiseptic for use in the inflamed urethra would be clean, non-irritating, penetrative, stable in aqueous solution, and effective alike against the gonococcus and any secondary organisms without being toxic to the host. At present no single preparation fulfils these requirements. Potassium permanganate is a feeble germicide, colours the skin and clothing, and seems to encourage intraurethral and paraurethral complications, its principal effect being to provoke a rapid and intense œdema undesirable in the early inflammatory stage. Mercurochrome is an exceedingly interesting experiment, mercury being linked to a dye in an effort to produce a deeply penetrating antiseptic. It penetrates well but stains everything it meets an almost indelible red, is distinctly irritating, and, as a urethral antiseptic, disappointing. Acriflavine also stains, and is subtly irritating, but is otherwise a quite useful all-round germicide, penetrative to a degree, unaffected by urine, and to be recommended for occasional rather than routine use. In a mixed infection it is my practice to employ separate agents for the gonococcus and saprophytes, used together if chemically compatible, seriatim if otherwise, the gonocide being frequently changed to avoid "fastness." Mercury oxycyanide, for example, is quite good against the staphylococcus and other followers, but an indifferent gonocide, while the innumerable silver colloids provide many reasonably effective gonocides, often not too clean, but bland and non-irritant when freshly prepared, and eminently suitable for use in the inflamed urethra. Among the milder silver preparations, indicated in the early stage as gonocides,

the writer favours argyrol, neoreargon, neoprotosil, cargentos, and collosol argentum, to be succeeded by albargin, hegonon, novargon, protargol, acriflavine hydrochloride, thallin sulphate, or silver nitrate later on as symptoms decline, and a little stimulation seems desirable.

Use and Abuse of Irrigation.

When anterior gonococcal urethritis terminates favourably damaged epithelium is shed, tension in the tissues diminishes, gonococci vanish, the meatal discharge lessens and stops, pus cells are no longer recoverable from the urine, and the urethral mucous membrane resumes its normal appearance. This is clinical cure and in established infections should be complete in three or four weeks. The failure of symptoms entirely to disappear may be due to over-treatment, the first urine containing light tissue detritus and perhaps just sufficient muco-purulence to render it slightly hazy. The presence of heavier flakes and many pus cells, and, particularly, the discovery of gonococci, indicate the persistence of infection deep in the tissues, in Littré's glands, the lacunæ of Morgagni or adventitious passages, or that infection has reached the posterior urethra. The latter development may be heralded by terminal hæmaturia, signifying an acute onset, and since much more serious events are now in prospect, correct management at this point is of obvious importance. The worst thing one can do is to attempt to irrigate the bladder from the meatus, infection of the seminal vesicles and prostate being in such case almost inevitable and extension to the epididymes likely. A better plan is to insert per rectum a suppository containing morphine sulphate (gr. ¼) and atropine sulphate (gr. 1/75), to be repeated in four hours, add tincture of hyoscyamus to the alkaline mixture, and omit all local treatment for 48 hours. At the end of this period the anterior urethra should be washed first with half-saturated acid boric solution and then with collosol argentum, after which a sterile No. 8-E. soft rubber catheter is introduced beyond the cut-off muscle and an ounce or more of collosol argentum allowed to trickle slowly into the posterior urethra and bladder, to be retained. This procedure is repeated in 24 hours, and thereafter 1 per cent. protargol may be substituted for a day or two, or retrograde lavage at once commenced with silver nitrate, 1–5000, containing 1 per cent. acid boric. More often posterior urethritis begins insidiously and pursues from the first an essentially chronic course.

While infection is restricted to the anterior urethra, local treatment is performed using a small all-glass acorn-tipped bulb or piston syringe. With the extension of inflammation beyond the bulbous portion to the membranous and prostatic urethra antiseptics must be carried past the cut-off muscle, and the method of their introduction is of some importance. With the Janet method of irrigation from the meatus there is the danger of injuring the inflamed mucous membrane through over-distension, and Kohnstam and Cave[1] have shown how easily fluid is driven into the seminal vesicles during forced irrigation of the bladder. For these and other reasons the retrograde method of lavage is preferable, the fluid being introduced into the bladder through a catheter or tunnelled sound and then voided naturally, when the tendency, if any, is to remove material by aspiration and contractile pressure from soiled glandular ducts.

The secretions of the seminal vesicles and (usually) the prostate are alkaline in reaction, a circumstance which might be expected to confer a certain protection against gonococcal penetration, but unfortunately does not do so. Inflammation may remain confined to the prostatic and ejaculatory ducts and, being catarrhal only, give little evidence of its existence. Where it is progressive the ducts become more or less occluded, drainage is impeded, the glands enlarge and become diseased. Owing to their vascularity, implication of the seminal vesicles is a threatening development, as toxic absorption is increased, and gonococci may eventually reach the general circulation; more commonly, however, there is extension along the ductus deferens to the epididymus. The advance of infection along the prostatic ducts leads to parenchymatous or interstitial prostatitis, the latter form proceeding to abscess formation.

Complications like epididymitis and hyperacute febrile inflammation of the prostate gland or seminal vesicles require the temporary cessation of treatment per urethram in favour of chemotherapy or vaccinotherapy, either of which is superior both in immediate and ultimate effects to operative or other methods in the writer's experience. The use of metals in this connexion is admittedly empiric, although there is an experimental basis for the belief that certain inorganic substances upon reaching the blood stream act like living or dead bacteria in inducing the leucocytes to liberate a non-specific bactericidal or bacteriostatic element. In practice it is often surprising how rapidly and completely acute epididymitis subsides after two or three intravenous injections of sulfarsenobenzene, and hyperacute inflammation of the other glands accompanied by temperature is almost equally well controlled by chemotherapy without, however, any marked effect being produced upon the general course of the disease.

Massage and the Passage of Sounds.

In health the seminal vesicles are difficult to distinguish per rectum, but they are readily palpated in disease, and there is a variable amount of conservative inflammation in the periglandular tissues. Depending upon the period and character of the infection, one or both lobes of the prostate may be enlarged, smooth and tense or, instead, feel nodular, suggesting a collection of lobulated masses. From the standpoint of remedial treatment, however, it is expedient to regard the inflammation of both prostate and vesicles as secondary, the primary lesions being in their ducts and the restoration of their calibre a necessary prelude to cure.

One or two quite light strokes are sufficient to empty a seminal vesicle whose duct is patent, and massage of the prostate gland should be of the gentlest description, a series of joined copy-book O's centripetally stressed from above downwards, and never the "firm downward pressure" of the older text-books. Massage at all violent readily injures these friable glandular tissues, and is more likely to retard than assist recovery. Nor is it necessary or desirable to attempt mechanically to empty either prostate or vesicles at each session if the trouble is, for practical purposes, obstructive.

There are experienced specialists who seem to counsel the abandonment of massage altogether, but it is a little difficult to accept this view. Light rectal massage seems needed to maintain tone and contractile power, combat stasis, and assist in the removal of cellular deposit, but the first consideration is to secure resolution of the inflammatory exudation in the urethral region so that adequate drainage may be re-established.

The passage of cold steel sounds, if properly timed, is a valuable aid in accelerating resolution and more effective than the use of dilators. It is often thought that the benefit accruing from instrumentation is wholly to be attributed to the mechanical stretching of the urethral canal, hidden foci being uncovered, crypts and folds ironed out, the lacunæ and Littré's glands pressed free of their contents. This explanation, however, is incomplete, for these are only incidental and relatively superficial effects of the passage of steels, more important being the influence upon plastic exudation, the resorption of which is actively promoted. In chronic anterior urethritis the parts become semi-indurated, and if inflammation persists connective tissue cells will gradually replace small cells in the subepithelial area, converting "soft" into "hard infiltration," found in organic

[1] Kohnstam, G. L. S., and Cave, E. H. P.: Radiological Examination of the Male Urethra. London. 1925.

stricture. The last, however, is a terminal condition and comparatively remote, and at an earlier stage infection and increasing tension disturb glandular function, the mucous membrane is irregularly swollen and dull, its folds are less distinct, and there is a patchy loss of surface epithelium, while layers of new cells are laid down beneath as a result of continued irritation. Analogous changes occur in the infected posterior urethra; the verumontanum is engorged and soft and the prostatic and ejaculatory ducts ringed with inflammation, and more or less occluded. It is true that a steel may, and does, expose an infective focus here and there as it traverses the urethra, but its real importance is the circumstance that it meets the first therapeutic indication in chronicity—namely, stimulation. After a preliminary blanching the urethral lining becomes congested, leading to a lively flare-up of the previously sluggish infective process. These symptoms decline after a few days' retrograde lavage, and with the ebb-tide some recession of the underlying inflammatory condition takes place. The next steel awakens less reaction, a third still less, until finally upon total resolution meatal discharge ceases, the urine clears, and the patient is pronounced clinically well.

The post-gonorrhœal "morning drop," whatever its bacterial content, is always suspect. It has led abruptly to the divorce court; a longer and well-worn path ends at the gynæcologist's. Treatment of the male gonorrhœic should be continued until subjective and objective signs of the disease have completely disappeared, the five-hour urine is perfectly clear, and white cells are no longer recoverable in significant numbers from the genito-urinary tract. After two months the complement-fixation test should be declining in strength or negative, and if the patient also registers a gain in weight his future may be regarded with confidence.

Clinical and Laboratory Notes.

THE TREATMENT OF MALIGNANT TUMOURS WITH RADIUM CATGUT.

By Dr. Eugen Joseph,
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THE beneficial influence of radium on malignant tumours is probably greatest when the radium is most evenly distributed and left for the longest possible time in the body or the tumour itself. Various methods have accordingly been invented by which radium is implanted in minute tubes throughout the substance of the tumour, especially when there is no prospect of a permanent result from operation. Implantation has therefore been chiefly employed in carcinoma of the bladder, either alone or after operation. The methods in use have the drawback, however, that the seeds are usually extruded from the tissues.

It is highly probable that the effect of radium is more powerful and lasting if the radium is introduced into the tissues themselves than if it is simply applied to the surface in the neighbourhood of the tumour, when the rays in the overlying tissues are bound to exhaust much of their strength. For this reason radium has given its best results in quite superficial tumours of the skin and of the subcutaneous cell tissue, such as telangiectatic nævi and papillomata of the skin. When radium is left in the tissues after partial or complete removal of the tumour, its effect becomes very much greater. Radium needles buried in the tissues are employed for this purpose, but they have the disadvantage that they are foreign bodies with an irritant action on the tissues and must therefore be removed after a certain time. They are, in fact, often extruded spontaneously. The mesothorium needles in common use at the present time remain in place well, but have not nearly such a powerful action as radium itself.

The retention of radium in the tissues has its own dangers. Rats die a certain time after being injected with a quantity of radium salts, and it is known that the largest quantity of radium which a person weighing 70 kg. can tolerate without grave danger is less than half a milligramme. This is probably why, apart from its expense, the method of leaving radium in the body, except in needles, has not been adopted. Nevertheless, it is undoubtedly possible by this means to prevent a certain proportion of recurrences and local recurrences of the growth. If, for example, the abdominal wall were sewn up after the removal of a tumour with radium catgut or radium silk, the stitch infections which occur so commonly in this region and in the soft parts of the extremities after the removal of a sarcoma or carcinoma would in all likelihood be avoided. Radium catgut is better than radium silk because it is absorbable. The radium should be so distributed over the gut that the dose in the length to be used shall not exceed half a milligramme. The efficacy of the method is shown by the following clinical observation.

The patient, a man aged 25, suffered from an extensive inoperable adenocarcinoma of a kidney. The tumour was about the size of a child's head and was surrounded by glandular metastases, one of which was the size of a normal kidney. I was nevertheless able to remove the tumour and some of the metastases together, but I had to leave the remainder, partly because their removal would have made the operation dangerously long considering the very weak condition of the patient and partly because they were technically inoperable on account of the adhesions they had formed with the large vessels. As I expected a considerable amount of hæmorrhage from this large parenchymatous wound I did not close the incision completely, but packed it with gauze in order not to leave too large a cavity. A few stitches were inserted in the overlying soft parts to keep the gauze in place.

It was easy to foretell that the wound would not close for some time and that the tumour would grow again from the remaining lymph glands and rests. This, in fact, took place. The cavity showed no signs of healing and looked like every other wound from which a large malignant tumour had been partially removed. There was no prospect of inducing it to heal by the ordinary methods. The tumour began to grow again like a fungus and, since it had no skin covering, to ulcerate and suppurate.

The condition was so desperate that I thought it worth while to try the effect of a "secondary" suture with catgut which had been steeped in radium substance. This was a pure experiment and I knew very little about either the preparation of catgut with radium or the proper manner in which to apply it. A certain amount of radium was certainly wasted, which was probably rather a good thing, for we had used 3 mg. of radium substance for about a metre and a half of gut. I closed the walls of the cavity with a purse-string suture, using about half a metre, and the fact that I did not use more prevented my exceeding the limits prescribed by Gudzent. Even so the patient showed very marked symptoms in the course of the next few days. He felt unwell, had no appetite, and was very excited and weak. After about a week these symptoms disappeared; moreover, the desperate condition of the wound began to improve. Apart from the fact that the surface had been drawn closely together with the purse-string suture, secretion gradually diminished; vigorous red granulation set in, although no other treatment was given, and the wound closed completely and healed over. The patient was discharged to his home apparently cured. I am fairly certain that without this procedure a fungoid, putrescent, ulcerating tumour would have formed in the wound and killed the patient in a short time, either by eroding the vessels or by exhausting his strength. Naturally I am doubtful whether he will remain well, but it is certain that if I had not performed the operation and followed it with the radium suture he must have succumbed.

Treatment with radium catgut can be carried out in a number of ways: the tumour may be excised and the wound closed with radium catgut, or an inoperable tumour may be threaded across and across with lengths of radium catgut, the dosage not exceeding 0·5 mg. The latter method is only applicable to inoperable tumours. It is not without its dangers, for cancer patients are usually in poor general condition. The surgeon should, therefore, both prepare the catgut

and apply the treatment himself. The method is far more difficult than deep irradiation and should not be left to an unqualified person.

Another consideration is the cost of the material. Estimating the amount of radium used at half a milligramme at the most, and remembering that some of it must inevitably be lost, it is necessary to start with at least one milligramme, which costs £10; moreover, the radium remains finally divided in the body and cannot be used again on other patients. And thus the method is unfortunately inapplicable to all cases of carcinoma. When cost forbids the use of radium, the catgut may be prepared with other substances which are unfavourable to the growth of tumours. Carl Lewin has introduced a compound which he calls "Introcid," a combination of iodine and cerium, one of the heaviest metals, with which catgut can be impregnated and which is considerably cheaper. Nevertheless, I shall continue whenever possible to treat inoperable tumours and the site of operation with freshly prepared radium catgut, and I expect a considerable degree of success and prolongation of life in cases which could not be benefited without the introduction of radium into the tissues. I have hopes that this method may prove a valuable standard auxiliary to the operative treatment of cancer in general.

A CASE OF
PERNICIOUS ANÆMIA NOT RESPONDING TO LIVER TREATMENT.

BY A. C. HAMPSON, *M.C.*, M.D. CAMB., M.R.C.P. LOND.,
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IN THE LANCET of Nov. 2nd, 1929 (p. 935), in an annotation on a paper by Dr. P. Emil-Weil (*Le Sang*, 1929, iii., 426), the question is raised: "Are there any cases of pernicious anæmia which will not respond to liver?" Pointing out that we have at present three criteria of pernicious anæmia—namely, achlorhydria, hæmolysis, and an increase in the mean size of the red cells—the annotation says that as Dr. Emil-Weil gives no information on the last two points "it would be rash to amend the aphorism that anæmia which will not respond to liver is not pernicious anæmia."

The following case, which has been under continuous observation at Queen Mary's Hospital for over two and a half years, is of interest in that it shows all the criteria mentioned yet has not reacted to liver treatment, though very large doses have been given.

A man, aged 50, first complained of giddiness in 1925. He was treated by his doctor for anæmia for some months. In October, 1926, he had 14 teeth extracted, and the extraction was followed by considerable hæmorrhage. From that time he had become progressively weaker. He was sent to Queen Mary's Hospital on Feb. 25th, 1927. On examination he was found to be a well-covered man, very anæmic, with a lemon-yellow colour of the skin. The spleen was palpable. His few remaining teeth were septic.

Examination of the blood showed: hæmoglobin, 32 per cent.; red cells, 1,600,000; white cells, 4200; polymorphs, 30 per cent.; lymphocytes, 68 per cent.; eosinophils, 2 per cent. Platelets were few. The mean diameter of the red cells was 8·2 μ, and the Price-Jones curve showed the typical distribution of pernicious anæmia. The cells themselves showed considerable variation in size and shape. Van den Bergh's test showed a negative direct and a positive indirect reaction. A fractional test-meal revealed a complete achlorhydria. Examination of the fæces for parasites gave negative results, and otherwise the stools appeared normal.

The remaining teeth were gradually extracted, and associated with this and treatment other than the administration of liver the blood condition showed slight improvement. Two blood transfusions were done, and at the beginning of August, 1927, the hæmoglobin had risen to 70 per cent. A fortnight later it had fallen to 50 per cent. Liver treatment was then commenced, and has since been given without interruption. This treatment produced no immediate rise in the value of the hæmoglobin, though later there have been periodic rises, apparently quite independent of the treatment. Taken as a whole the level of the hæmoglobin has become progressively lower, being at the present time 25 per cent. A consideration of the blood examinations suggests that the liver diet may have produced a temporary fall in the colour-index during the first few weeks. During the same period the mean diameter of the red cells became less (but still above normal). Such variations occurred in other cases before the days of liver treatment, and that this result was at all events only temporary is shown by the fact that since March, 1928, the colour-index has never been below 1·1, while at times it has been as high as 1·4.

The test-meal and the van den Bergh reaction have been repeated several times with results similar to those recorded above. On several occasions it has been necessary to resort to transfusion. In July of this year he was found to have pus in the ethmoidal cells. This has been dealt with without improvement of the condition of the blood. The patient's weight has been well maintained throughout the whole period. The liver for this patient's diet was prepared in the same way as that used for other patients suffering from pernicious anæmia who have been in the hospital during the last two and a half years. The other patients readily responded to treatment.

The majority of the investigations recorded above were conducted by Dr. Arthur Davies and Dr. L. Hewlett, to whom I am much indebted.

INTERNAL SPLINTING FOR FRACTURES.

BY R. E. PASCAL,
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IT is well known that efficient immobilisation offers the best means of relieving the pain of fractures and of ensuring bone consolidation. Absence or delay of bony union is due to various factors, known and unknown. An examination of radiograms shows that there is a correlation between these defects of repair and the peculiar rarefaction and loss of calcium known as osteoporosis. This condition is often seen after operations on the skeleton, especially when two bony fragments have been united by a piece of metal. The metal has naturally been blamed, but osteoporosis may appear in one case and fail to appear in another when the conditions seem identical.

Robineau and Contremoulins,[1] after long study of the modifications in bone seen radiologically after operations for fracture of the neck of the femur, have established certain biological laws which may be summarised as follows. Osteoporotic changes do not occur after splinting with beef bone or non-oxidisable metal: (1) when the splints have been mounted and fixed in strict accordance with the laws that a first-class mechanic would apply in setting up a delicate piece of mechanism; (2) when the splints have been calculated to withstand the strain to which they will be submitted; and (3) when the splint and the pieces of bone which it unites are not submitted to premature mobilisation or any disturbance which might compromise the good position originally obtained.

This is quite a new conception; an example will make it clear.

A fracture of the neck of the femur is treated surgically and all goes well. The patient gets up too soon and disturbs the neighbourhood of the fracture, which is not yet completely consolidated. A few days later he has some pain and X rays show commencing osteoporosis around the screw. If the injured limb is again immobilised, the pain and the osteoporosis soon disappear and full consolidation is obtained.

The results got by Robineau and Contremoulins afford the best proof of the importance of absolute fixation of bony fragments and splints in order to prevent any change in the bony tissue.

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[1] Robineau, M., and Contremoulins, G.: Note presented by Dr. Bazy, Compt. rend. Acad. des Sci., 1925, clxxx., 1543.

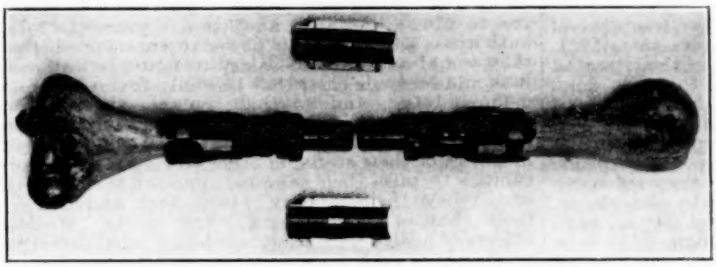
Devices used by Robineau and Contremoulins.

For repairing the shafts of long bones they do not use the strips of Putti and Parham nor the plates of Lambotte and Shermann, because from a mechanical point of view these do not offer sufficient resistance. On the principle that a given mass is stronger when disposed as a hollow cylinder than in any other form, they constructed sheaths to enclose the broken bone completely and to grasp it tightly. The length of the sheath depends, of course, on the size of the bone, the direction of the fracture, and the number of the fragments. Correct adjustment is easy, for the sheath only needs fitting and tightening. No other immobilisation apparatus is required, even for a fractured femur. The joints may be moved a few days after operation, and bony union is secured earlier than after bloodless operation or other surgical techniques.

After arthrodesis and resection of the knee-joint, when ankylosis is desired, Contremoulins and Robineau fix the tibia to the femur by two beef bone screws set crosswise. Here again no immobilisation is required, and 45 days after the operation the patient can walk about and resume active life. His period of convalescence is thus halved. There is considerable difference between healthy and diseased bone; in resections for tuberculosis the bones are generally decalcified and soft and the correct placing of screws is very often impossible. Osteoporosis, which never appears in perfectly healthy bone, may then occur round the screws, but so far it has always been too limited to retard bony union.

The long metallic sheaths used for fractures had proved that the Durville bronze used was quite well borne by the tissues. Only three times during eight years had it been necessary to remove the sheath, and healing had been obtained without disturbing it in infected suppurating fractures. Contremoulins and Robineau thought, therefore, that they could safely enclose the bones in an even more massive material. After subtrochanteric osteotomy of the femur two independent pieces of metal are screwed into the two fragments; the screws are split longitudinally and the points separate in the medullary cavity, thus acquiring a very strong hold (Fig. 1). The two pieces of metal are then joined by a gear-toothed articulation, which allows the surgeon to correct any faulty alignment and put the limb into the correct position before the device is locked. A bone graft is added to the metal splint to ensure bony union. The patient can leave his bed six to eight weeks after operation without ever having been in an immobilising apparatus. There is no fear of secondary deviation or a return of the original deformity.

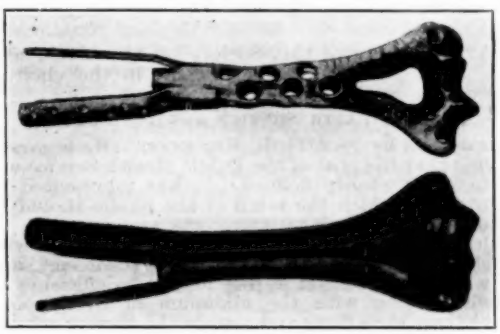
FIG. 1.



Bronze sheaths used for joining separated fragments of bone.

Finally, Contremoulins and Robineau have solved the problem of treating cases in which there has been considerable loss of bone substance. Their first case was treated four and a half years ago. The lower third of the humerus was replaced by a mechanical device made of steel covered with dentist's rubber (Fig 2). Success depended on secure union between the prosthetic device and the bone. To this end a steel dowel covered with ebonite was driven with great care but considerable force into the medullary cavity of the resected humerus. To prevent splitting as a result of violent lateral movement, three processes mounted on the prosthetic piece were screwed to the surface of the humerus and held in place by a ring of aluminium bronze (Fig. 3). Repeated X ray photographs failed to reveal any osteoporosis; indeed, after two years there was a slight condensation of the humerus around the metal. The patient has full use of his arm, works as an errand man with a tricycle, and plays the banjo.

FIG. 2.



Steel substitute for lower third of the humerus (covered with dentist's rubber).

FIG. 3.

Radiogram, taken five years later, showing the substitute (see Fig. 2) in position.

The mechanical adjustment of metal devices constitutes a new surgical method which will have many difficulties to overcome, for it can leave nothing to chance. Each case requires elaborate investigation, X ray measurement of bone,[2] special design of pieces for their particular duties, a carefully prepared scheme of operation which must be strictly followed, a peculiarly thorough sterilisation—especially of rubber-covered devices—and rigorous asepsis. These

[2] Contremoulins, G.: Arch. d'Elect. Méd., 1901; Ann. d'Electrobiol. et de Radiol., 1904, Nos. 5 and 6; Presse Méd., 1923, Nos. 74 and 78.

difficulties are of little importance when weighed against the benefits of retaining a limb otherwise doomed to amputation, and of restoring functional activity in a case where all the classical operations would fail. There is still scope for advance. It may be possible in time to replace an entire bone with metal, and to make a complete joint endowed with normal movement.

Results.

The sheaths or sleeves for repairing fractures of bone shafts have given excellent results since 1921. In only three out of over 100 cases thus treated have they had to be removed, and this was done very easily. Many of the patients had compound fractures but this did not prevent sound consolidation. The sheaths are quite well tolerated and I have never observed pseudarthrosis. The callus grows inside and outside the sleeve; on the femur very extensive callus-formation may be seen outside the sleeve. The big internal splinting devices set by us have never yet had to be removed, though it is now more than five years since the first case was treated in this way.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT a meeting of this Society on Dec. 20th, with Dr. J. J. BUCHAN, the President, in the chair, a discussion on the

PUBLIC HEALTH SERVICE AND ITS FUTURE

was opened by Prof. H. R. KENWOOD. He began by saying that the goal of the Public Health Service was distant but clearly defined. It was represented by a future in which the mind of the public should be attuned to public health precepts and practice; in which general practitioners would be concerned with public health measures of preventive medicine; and in which there should be the maximum efficiency of administration with the minimum of overlapping. That there were flaws and gaps in the present scheme no one present need be reminded; as an illustration he would mention the tuberculosis system, which was poorly organised for control of early cases and for after-care, but which was responsible for such excellent work in the intermediate stages. The need here was for earlier diagnosis and treatment and more efficient after-care. To give an illustration in another direction, Sir George Newman stated that at 5 years of age a quarter of the children entering school required medical attention. At present the public health scheme lacked completeness and comprehensiveness. A national scheme of health education was required, in which the Society would play an important part, and such a scheme would depend largely on the coöperation of the family doctors; no services should be undertaken by the health authorities which the general practitioners were able and willing to carry out. On the other hand, it was essential that general practitioners should be imbued with that understanding of preventive medicine which at present they lacked. Experience of general practice was essential to a public health official, and the National Health Insurance scheme gave opportunities for coöperation between panel doctors and local health authorities.

Status of the Public Health Service.

The efficiency of the public health service, as well as its status, depended on the quality of those who entered it. At present there was disappointment and discontent among the assistant medical officers of the service, owing to the insufficiency of the salaries offered by the local authorities. Only a few of the workers could hope to become heads of departments, and many of these had been in office for years without hope of improving their prospects. As a rule an assistant medical officer had no hope of promotion unless his chief retired; applications for senior posts elsewhere usually resulted in disappointment, owing either to local competition or because the experience of the applicant was considered to be "too narrow." An assistant medical officer began work at a salary of £500 or £600 a year; after eight years he might rise to £700; and after another five years the local authorities had it in their power to consider whether they would augment his salary or not. In any case it should be made clear that this only covered certain defined duties, and anything outside those duties should receive extra remuneration. Medical officers of health should allot as many duties as possible to members of their staffs, in order to give them opportunities to raise their salaries, augment their experience, relieve the monotony of their work, and increase their chances of obtaining better posts. Medical officers of health were overloaded with administrative work, and should delegate work outside the office to assistants. He had heard them accused of missing admirable opportunities for research, but the truth was they had no time. He would urge all medical officers of health to take every opportunity of bringing the work of their assistants before the authorities; this course raised the quality of the team work and helped juniors to obtain better posts. A new superannuation scheme was required; officers should be able to serve more than one public body without loss of superannuation. Also he would protest against the age-limit at 40 years, a period at which officers were most valuable in point of experience.

Prof. W. W. JAMESON said he would like to refer to the past; it was only 50 years since the local sanitary authorities had been put under statutory obligation to appoint public health officers, and they had as a rule appointed the local poor-law medical officer, who knew nothing of preventive medicine. Forty years ago the county and county borough councils had come into being; but public health service as it is to-day dated from 1907. In 1919 and 1920 many new appointments were made, until now there were 1500 to 1600 whole-time medical officers in England and Wales, of whom only 360 were medical officers of health. For some time past a campaign for higher salaries for assistant medical officers had been in progress. Advances had been made in the work and difficulties overcome; as a result of the Local Government Act, coming into force next year, the medical officers of health would be able to coöperate on a larger scale with the local authorities and with voluntary hospitals in their districts. The public health service was the only service requiring a special post-graduate degree in its members, and students in hospital were at present instructed too little in preventive medicine. At the present time welfare and maternity posts were often filled by persons lacking the diploma of public health, while their junior unqualified assistants had done a six-months course in this subject. Districts had formerly been much too large for adequate administration by the medical officer of health, and this was still the case to some extent; thus one area consisted of 15 districts and 500 square miles, without provision of travelling facilities. Prof. Jameson thought that some part-time posts might be occupied by general practitioners, in order that they might have a direct and practical interest in the work. He agreed that there were plenty of opportunities for research but too little time. The opening of the new School of Hygiene, with a Government guarantee of adequate support, was significant of the interest which preventive medicine was awakening.

Discussion.

Dr. A. K. CHALMERS said that the new Act was the opening of a new scheme; to retain the best men in the service salaries should be scaled. The opportunities for research were wide and not confined to the laboratory. Diphtheria was more prevalent in

Scotland of late years, while scarlet fever, though at present of a mild type, appeared to be unaffected by public health activities. These offered two interesting fields for investigation.

Dr. T. SHADIK HIGGINS (Cape Town) described the present position of South Africa with regard to public health. The scheme, he said, was modelled on the British service, but did not control the school medical case, and had no connexion with poor relief work. The work was complicated by the existence of a white colony and a large half-breed community, as well as the native inhabitants. The death-rate among the half-breeds or "Cape coloured" cases was much higher than among Europeans, as was also the susceptibility to tuberculosis. He attributed their condition to insufficient wages.

Dr. E. T. NASH said that in reply to a questionaire sent by post to assistant medical officers in the service he had ascertained that the average age of these members was 39½ years, that 63·5 per cent. were married, and that few had a salary exceeding £700 a year. There was a 1 to 9 chance against any of them becoming a chief, and many had children to educate. Consequently the service was a disgruntled one. He considered that general practitioners might do part-time work in the service, but he had inquired among practitioners in his division of the British Medical Association and only two had been willing to undertake the work, both of whom were newly established. He suggested that a census should be taken of members of the service.

Dr. W. G. WILLOUGHBY said it was unfair to lead junior members of the profession into a blind alley. He did not agree with the idea of a scale, but thought the maximum salary should be open to allow the best worker full prospects.

Sir THOMAS LEGGE said he spoke from the industrial aspect. He had hoped to hear something at the meeting of the Factories Bill, but the Local Government Act was evidently of more importance at the moment to the Society. He regretted that so much of the discussion had been concerned with the pay. In his experience the poorest paid generally worked best. As a Society they should attempt to get rid of their extreme sensitiveness; the slightest criticism of their work was apt to provoke a storm.

Dr. G. F. BUCHAN said that the work of the service was enormous, and extremely attractive to the worker entering it. The opportunities for research were considerable, and the only reason for discontent was the limitation of salary. He thought promotion should be arranged on the plan followed among the clergy, and not as at present, where the local assistant was usually promoted into the vacant senior office. He did not see how the general practitioner could be worked into the scheme, or what offices he could perform.

Dr. W. G. BOOTH said that if the minimum salary were fixed at £700 a year, he thought the authorities would pay it. He considered the Society should look ahead. Was it to become a State service? If so, now was the time to fix salaries on a suitable scale.

The PRESIDENT said that medical officers of health nowadays were purely administrative; they did not interfere with the welfare or tuberculosis staffs if the work was well done, and the same would apply to factories should they come under the control of the service. The members of the service were in no sense grasping; it was in the interests of the health of the general public that they appealed for reasonable conditions of work. As to being sensitive, no one could occupy a public health office for so much as a year if he had not the hide of a rhinosceros. Disregard of criticism was quickly acquired.

Dr. ANDREW BALFOUR said that the new London School of Hygiene hoped to supply "refresher" courses, and to help the workers in the public health service to keep abreast of advances in research.

MANCHESTER MEDICAL SOCIETY.

AT a meeting of this Society on Dec. 4th, 1929, with Dr. A. RAMSBOTTOM, the President, in the chair, a paper on

Sensitisation Associated with Eczema and Trade Dermatitis of the Eczematous Type

was read by Dr. WILLIAM DYSON. These two conditions, he said, were clinically and histologically indistinguishable. Their liability to relapse was well known, and if the attacks were prolonged or often repeated a general sensitisation of the whole skin might arise. When a sensitisation was established the skin would react to any external irritant. In Dr. Dyson's opinion the cause of this sensitised state must be looked for in some change which had taken place in the individual. He suggested that this change was brought about as the result of the absorption of the products of inflamed or damaged epithelium which set up a condition of hypersensitiveness—"an anaphylactic state." He showed that in non-discharging pruritic dermatitis a high blood-sugar was to be expected, whereas in cases which were discharging the blood-sugar content was lower, suggesting that when the products of inflamed epithelium were absorbed a high blood-sugar was to be expected, whereas when these products were being discharged on the surface the blood-sugar content was less. On the supposition that sensitisation was an anaphylactic state, he had treated 15 cases of eczema and eczematous trade dermatitis with injections of their own blood, with a view to producing and keeping them for a long period in an anti-anaphylactic state, and in this way desensitising the patient. In 10 out of the 15 cases the treatment had been successful in clearing up the dermatitis, and only one of these ten cases had relapsed up to date.

Dr. W. J. RUTHERFURD read a paper on Small-pox in Pre-Norman Britain.

New Inventions.

ETHYL CHLORIDE INHALER.

WHEN administering ethyl chloride one requires a special inhaler unless the "open method" is adopted. It has occurred to me that if a fitting could be incorporated in the usual dental N_2O bag the necessity for extra apparatus could be avoided. I have therefore devised a simple apparatus to this end, by adapting the spring ball valve of Looseley's inhaler to a flanged metal tube that can be fixed to any ordinary gas-bag, without taking up additional space. When attaching this fitting (shown by the illustration) all that is necessary is to punch a ⅜ inch hole in the bag, preferably near the stop-cock where the rubber is doubled. The advantages of this fitting are mostly obvious in juvenile dental patients; it is inexpensive, and can be fitted to any existing gas-bag.

Messrs. A. Charles King, Ltd., 34, Devonshire-street, London, W., are the makers.

GERALD MORIARTY, M.D. Edin.

Reviews and Notices of Books.

Principles of Bacteriology and Immunity.

By W. W. C. Topley, M.A., M.D., M.Sc., F.R.C.P., Professor of Bacteriology and Immunology, University of London, London School of Hygiene and Tropical Medicine; and G. S. Wilson, M.D., M.R.C.P., D.P.H., Reader in Bacteriology and Immunology in the same School. London: Edward Arnold and Co. 1929. 2 vols. Pp. 1300. With 242 illustrations. 50*s*.

This book is one which we feel sure will receive a cordial welcome from all practising bacteriologists and teachers of this subject. The authors have for some years been engaged in teaching bacteriology, as a post-graduate subject, for the diplomas of the universities of Manchester and London, and the present work is the outcome of their experience, being based upon the course of study which they now give in the London School of Hygiene and Tropical Medicine.

The book consists of two volumes each of some 600 pages. The first of these is an up-to-date text-book of bacteriology in which the conventional arrangements are generally followed; whilst the second treats in detail of the reactions between the body and bacteria—i.e., infection and the immunity phenomena. Taking these volumes separately, for in effect they are almost distinct, we note that the first consists of two sections, in one of which historical, morphological, and physiological considerations are dealt with. No attempt has been made to set out cultural and tinctorial methods at any length, and in our opinion Prof. Topley and Dr. Wilson are wise in this bold exclusion, since there are already numerous special works on these subjects. The historical outline is an admirably concise and accurate review of the evolution of bacteriology, whilst the chapter upon physiology is admirably lucid and includes an honest attempt to correlate what is known of bacterial metabolism with current knowledge of enzyme action and other general biochemical phenomena. Bacterial variation is described clearly, but condensation has made the facts appear simpler than they really are. The systematic treatment of bacterial species, which occupies the second half of this volume, is orderly and convenient; the same group of properties being described seriatim for each organism. This arrangement will be much appreciated by students and makes for ease and rapidity of reference. The nomenclature used is that of Bergey, with inconsiderable modifications; the authors admit no great love for this terminology but adopt it (for want of better) as being at least a reasonable advance upon the irrational pre-war usage.

The second volume is also divided into two parts, of which the first deals with infection and resistance, and the second with the applications of bacteriology to medicine and hygiene. It really forms a separate text-book upon infection and immunity. Thus, whilst the actinomyces occupy Chapter XII. in Vol. I., the disease, actinomycosis, occupies Chapter LV. in Vol. II., and the same holds good for other organisms and the infective condition to which they give rise. It might be imagined that this arrangement, which is no doubt the outcome of experience in teaching bacteriology as a pure subject, would lead to considerable overlapping; and the impossibility of entirely preventing this is freely admitted. But so much care and judgment have been exercised in the segregation of material that we have sought in vain for serious evidence of this defect. In some places the line has obviously been difficult to draw. The serum reactions find themselves in Vol. I., whilst a consideration of animal immunity and the humoral antibodies is in the second volume. In general, there is a good deal to be said both for and against this arrangement, but the successful way in which Prof. Topley and Dr. Wilson have overcome its inherent disadvantages forms a strong argument for its use.

It is scarcely possible here to discuss more than a few sections of the book, but we note that adequate but not disproportionate consideration is given in Vol. II. to the special work of Topley and his associates upon experimental epidemiology and herd immunity. The laboratory diagnosis of enteric infections is considered in great detail, the authors pointing out that non-recognition of the diphasic character of the salmonellas invalidates the assumptions upon which Dreyer's standards were adopted, and, further, that there has been no general adoption in routine diagnostic practice of the contributions of Andrewes and White to our knowledge of antigenic structure; one consequence being that O agglutination is in general absent with "standard" formalinised suspensions. The "Widal" test, as recommended by the authors and devised to detect both H or O agglutinins for the common types of enteric infections, involves the use of no less than nine suspensions. This theoretically desirable complexity means that such tests, to give accurate and full information, can only be carried out in a well-equipped and well-staffed laboratory or, alternatively, that the clinical pathologist in smaller centres must become completely dependent upon the larger institutions for the supply of his reagents.

The authors' researches into the literature have evidently been both extensive and critical, and whilst they do not seem to have neglected any contributions of serious merit they have avoided the mere catalogue of other people's opinions—sometimes entirely contradictory—which is a common and unfortunate feature of many modern pathological and bacteriological books.

There is much in these volumes to commend and little to criticise. The material dealt with has been well digested and is summarised and presented in an orderly and easily assimilable form, and in far greater detail than in any English or American text-book of reasonable size with which we are acquainted. Most of the outstanding problems of bacteriology are courageously tackled; the issues are clearly and frankly set out and the authors' general conclusions are presented with a happy combination of dogmatism and judgment. The inquirer is rarely left in the air; usually he is presented with some sort of working hypothesis even if this is admittedly a temporary one. The book is a notable production and illustrates well the high level of bacteriological practice and teaching now attained in our universities.

Effects of Moisture on Chemical and Physical Changes.

By J. W. Smith, B.Sc., Ph.D. London: Longmans, Green and Co. 1929. Pp. 235. 15*s*.

Life is impossible without water, and yet the study of extreme dryness may be of great interest to the biochemist, since the catalytic effects of water can only be demonstrated by careful dehydration. This book is a summary of our present knowledge of the influence of traces of moisture on chemical and physical changes, and therefore deals principally with the "abnormal" behaviour of very dry substances. Many of the results described will surprise the purely medical reader, as also will the extraordinary precautions which are necessary in the doing. For example, everyone knows that iron will not rust in dry air, but the fact that potassium can be distilled unchanged in very dry oxygen is not so familiar. Indeed, the most striking characteristic of water as a catalyst is the very large number of reactions which it affects. Of more than a hundred which have so far been studied only a few have given negative results, and examples of every type of chemical reaction have been shown to be stopped, or at least retarded, by thorough drying. In the case of physical properties the general nature of the effect is even better established since *all* the liquids and solids so far investigated have shown some change in physical properties after intense desiccation. The work of H. H. Baker is a good example of the care needed to obtain positive results.

He sealed up a number of liquids in glass vessels with phosphorus pentoxide and left them for eight years from 1913–21. At the end of this time he found that the boiling points had risen considerably; for example, alcohol boiled at 138° C. instead of at 78·5°C.

A very large number of theories have been put forward to explain aqueous catalysis. Those best known in biochemistry assume the formation of an intermediate compound and have been used especially in the case of biological oxidations; as an example we may recall Traube's theory, in which hydrogen peroxide was the compound selected. Such theories are justly criticised by the author on the ground that they are not of sufficiently general application. More space is devoted to Smits's theory, which is not open to this objection, and which is supported by considerable experimental evidence. Smits assumes that a substance exists in two or more forms in equilibrium with each other. Only one of these is chemically active, and the equilibrium is "frozen" or actually displaced in the direction of the inactive form by the removal of water. The different forms have different physical properties, and can be separated by fractional distillation of the very dry substance, a feat which has actually been accomplished in the case of sulphur trioxide. Smits's theory also appears to supply the best explanation of the way in which extremely small quantities of water may act, since the fraction of the total molecules existing in the active state is about 10^{-10} and the fraction of water molecules necessary for the activation of a completely inactive system is of the same order. An interesting chapter is included on the influence of traces of other catalysts on the physical properties of liquids. When liquids are sealed up with solid catalysts such as platinum black or charcoal, changes in the vapour pressure, surface tension, and density have been demonstrated. These are explained in a similar fashion to the above, a shift in the inner equilibrium between the smaller and larger molecules being assumed.

The book is well written and the subject is ably presented. The historical introduction and the diagrams in the text are features of special value, and the author is to be commended for his refusal to sacrifice accuracy to simplicity. He is careful to avoid making dogmatic statements, and succeeds in giving an unbiased account of the many controversies which have arisen; if the result is slightly confusing in places this is to be attributed to the unsettled state of the subject, which provides ample justification for his impartial attitude. The book will be read with considerable interest by biochemists, if only because it reveals how little we know of catalysis in general, and of the catalytic action of water in particular. At a time when the study of the action of water on pure substances has only just begun, we should not be surprised at the difficulty of assessing its rôle in the living body.

NOSE, THROAT, AND EAR.

A Manual of Diseases of the Nose, Throat, and Ear. Sixth edition. By E. B. GLEASON, M.D., LL.D., Professor of Otology, Medico-Chirurgical College, University of Pennsylvania London and Philadelphia. W. B. Saunders Company. 1929. Pp. 617. 21*s*.

THIS well-known manual was first publised in 1907. In these two and twenty years there has been much progress in the science of otolaryngology. Though the book has become somewhat large with each edition, it has nevertheless suffered a little from compression; the print is rather close, and the illustrations, especially those of pathological subjects, too small. A more rigorous exclusion of obsolete matter, such as the removal of septal spurs with the saw, would help to solve the difficulty of lack of space. Misprints and errors of grammar are too frequent.

The book is full of information derived from a ripe experience and well deserves its popularity.

TROPICAL MEDICINE.

Krankheiten und Hygiene der Warmen Länder. A Practical Text-book. Third edition. By Profs. Drs. REINHOLD RUGE, PETER MÜHLENS, and MAX ZUR VERTH. Leipzig; Georg Thieme. 1930. Pp. 496. M.39.60.

THE general format of this out-standing text-book remains the same, and although a large amount of additional information has been compressed within its bulk, mainly by the liberal adoption of small type and slightly larger pagination, the total increase is but five pages over the original. It differs from English text-books on tropical diseases in that much space is devoted to the consideration of the usual subjects of tropical climate, acclimatisation, nutrition, and general adaptability to tropical conditions. A good deal of this information is based upon somewhat debatable data and much is the outcome of ordinary common sense. The metabolism of the human body is necessarily disturbed by exposure to tropical conditions, but the adaptability of the human organism is so great that much more detailed biochemical work will have to be undertaken before these variations can be placed upon a strictly scientific basis. We may note amongst other minor changes a small section devoted to surgery in the tropics. The advisability of this inclusion is questionable, for a large subject is treated in an abbreviated and rather stilted manner. The number of excellent coloured plates remains the same though the text-figures are increased to the number of 40. A whole plate is devoted to microphotographic reproductions of malaria parasites (from Kolle and Wassermann), which, however admirable, do not by any means approach in teaching value the black-and-white drawings or coloured figures. The production of this edition is a testimony to the continued vitality of tropical medicine in Germany.

Hookworm Disease: Its Distribution, Biology, Epidemiology, Pathology, Diagnosis, Treatment, and Control. By ASA C. CHANDLER, M.Sc., Ph.D., Professor of Biology, Rice Institute, Houston, Texas; recently Officer-in-Charge, Hookworm Research Laboratory, School of Tropical Medicine and Hygiene, Calcutta, India. London: Macmillan and Co., Ltd. 1929. Pp. 494. 21*s*.

HOOKWORM disease is one of the most widespread and devastating of all ills. Its literature is so scattered that one who undertakes to compress it into reasonable compass deserves gratitude. Dr. Asa Chandler, who is an authority of international standing, has done the work admirably well. Our knowledge of the biology and morphology of *Ancylostoma duodenale* is still based upon Loos's exhaustive work published in 1911; but since that time great advances, thanks mostly to the energies of the Rockefeller International Health Board, have been made in the direction of prevention and treatment, and it is from this aspect of the subject that the practical medical man will derive much assistance from a study of Dr. Chandler's monograph. According to Dr. Chandler, thymol and beta-naphthol treatment have been definitely replaced in hookworm therapy by oil of chenopodium and carbon tetrachloride. Oil of chenopodium, he states, has advantages over the two first-named drugs in its safety and simplicity of administration, and also in its further advantage of being effective against ascarids and other intestinal nematodes. Carbon tetrachloride, in his view, outscores oil of chenopodium in about the same degree that chenopodium outscores thymol. In the vast majority of patients he believes it to be quite harmless, produces few or no unpleasant symptoms, and can usually be taken without interference with the day's work. Its cost is so low as to be negligible. Dr. Chandler holds that the combination of carbon tetrachloride and oil of chenopodium, each in reduced dosage, provides an almost ideal anthelminthic.

THE QUEEN CHARLOTTE'S PRACTICE OF OBSTETRICS.

Second edition. By J. BRIGHT BANISTER, M.D., F.R.C.S., ALECK W. BOURNE, M.B., F.R.C.S., TREVOR B. DAVIES, M.D., F.R.C.S., L. CARNAC RIVETT, M.C., F.R.C.S., L. G. PHILLIPS, M.S., F.R.C.S., and C. S. LANE-ROBERTS, M.S., F.R.C.S. London: J. and A. Churchill. 1929. Pp. 635. 18*s*.

THE second edition of "The Queen Charlotte's Practice of Obstetrics" differs little from the first. Such small errors, misprints, and omissions as creep into new books, in spite of the most careful proof-reading, have been corrected, but little new matter has been added. The authors do not claim that the work is more than an exposition of the practice of a famous maternity hospital, teaching which may or may not be generally accepted. This fact disarms criticism, which in any case would be difficult to justify since the authors have produced one of the most practical works on obstetrics in the English language. There is one point to which attention might be drawn. Throughout the book the term "disproportion," which is now so largely adopted in place of such terms as "minor degree of contracted pelvis," is hardly mentioned. Surely the majority of "tight fits" are better regarded and dealt from this point of view. In the same connexion it is to be regretted that the importance of moulding of the fœtal head does not receive greater prominence.

The first edition achieved immediate and well-deserved popularity which is likely to continue.

MAN'S PLACE AMONG THE MAMMALS.

By F. WOOD JONES, F.R.S., Professor of Physical Anthropology, University of Hawaii. London: Edward Arnold and Co. 1929. Pp. 372. 21*s*.

WHEN the conception of evolution was first sprung upon a horrified Anglo-Teutonic world by the work of Darwin and Haeckel, the way had already been prepared by several zoologists who had recognised the varying degrees of differentiation in the animal world and had arranged all known species in scales of increasing complexity. The idea of evolution did little more than give a shake to these rigid schemes and turn the "échelle des êtres" into a moving stairway. At first, therefore, the idea of evolution followed strictly along the lines of this classification, and it was assumed implicitly that the amœba had evolved to man through all the other known animals, and also through a number of intermediate stages which have not survived. As soon as the idea of evolution had been accepted without the prejudice which it first evoked, it became plain to thoughtful biologists that the rigid and relatively simple process described by Haeckel could not represent the truth, and the conception of evolution has been steadily changing ever since from that of a stairway to that of a tree. The tree has many collateral branches, and most of the animals living on the earth to-day are representatives of the extreme tips of twigs, rather than occupants of places on the stem from which other twigs arise; they are, in fact, cousins—often several times removed—and not ancestors or descendants of each other.

So much is admitted by most, but when it comes to applying the principle to man and his nearest relatives, there is still some fairly acute difference of opinion. Prof. Wood Jones stands in the front rank of those who apply this idea whole-heartedly and declare that the problem of man's ancestry is to be studied not among the apes and monkeys, but among simple arboreal mammals. As a result of following up this line of thought he has come to the conclusion that man is structurally a very primitive mammal, much nearer the common ancestors of the mammals than most of the animals we know to-day, but distinguished by the development of his brain and hand and the changes incident on the assumption of the upright position. These views have been put forward in two previous publications—"Arboreal Man" (1916), and "The Problem of Man's Ancestry" (1918)—both of them somewhat hampered by the difficulties of publication and research during the war, and both of them in the form of published lectures. Now Prof. Wood Jones has supported these by the volume under review, which goes thoroughly into all the evidence for his theory and reviews the evolution of biological thought and the anatomical characteristics of the primates in relation to those of man. His conclusions, summarised, are: that the members of the proto-human stock were small, active, agile animals, with legs longer than their arms; that they were already erect and prepared for terrestial life, and that they possessed enlarged crania, small jaws, and moderately large eyes. He vividly contests the picture of the slouching hairy brute with elongated arms, lumbering into a stage of partial uprightness, which is usually drawn as that of the ancestor of man. Like all Prof. Wood Jones's books, this is lucidly and attractively written and illustrated with charming line-drawings of his own and excellent photographs of monkeys and apes from the London Zoo. As he says in his preface, the objections to his thesis are of two kinds: first that it is ridiculous and unwarranted, and alternatively, that it is so generally admitted as to stand in no need of exposition. Whichever point of view the expert may take, he will still need to read this book, and to the ignorant, who do not profess to know all there is to be known about evolution, it will certainly be a delightful review of the ever-absorbing problem of their own ancestry.

RECENT WORK ON COLPORRHAPHY, RHEUMATISM, AND COLI BACILLURIA.

By E. HESKETH ROBERTS, F.R.C.S. Ed., M.B., B.S. Lond., Gynæcological Surgeon, St. John's Hospital, Lewisham. London: H. K. Lewis and Co., Ltd. 1929. Pp. 28. 3*s*.

IN this short monograph the author gives a careful account of the technique he employs for the operations of anterior colporrhaphy and posterior colpoperineorrhaphy. He describes a new layer of the visceral pelvic fascia which runs down the lateral aspects of the rectum and vagina. Recurrence of symptoms is liable to occur after these operations, and the author puts forward his views on the significance of chronic rheumatism and colon bacilluria as ætiological factors.

OUTLINES OF DENTAL SCIENCE.

Vol. XII., *Dental Local Anæsthesia*. By JOHN JAMES, L.D.S., Lecturer in Operative Dental Surgery, King's College Hospital Dental School. Edinburgh: E. and S. Livingstone. 1929. Pp. 127. 7*s*. 6*d*.

THIS is a straightforward account, suitable for senior students or junior practitioners, of the elements of local anasthesia as applied to dental surgery. The book is essentially practical and obviously written by one who has had considerable clinical experience. Mr. James favours cocaine in preference to novocain. He holds the toxicity of cocaine to be negligible and has no fear of engendering drug addiction by its use. Somewhat illogically he bases his preference for novocain in regional injections on its lesser toxicity. We know that many dentists use cocaine as a routine anæsthetic and that accidents are few, but in a book primarily intended for students or junior practitioners such advice may be dangerous. The technique of local anæsthesia is clearly and adequately described. The chapter on novocain dermatitis should prove useful, but for the most part the chapters on complications and contra-indications are rather too brief, since the possible complications of local anæsthesia are numerous and may be serious. Similarly, the contra-indications to the use of a local anæsthetic are of definite importance, and should receive full consideration in a text-book on local anæsthesia.

THE LANCET.

LONDON: SATURDAY, JANUARY 4, 1930.

THE COMING OF RADIOLOGY.

A MODEL on view at the Charing Cross District Railway Station takes the lid off the underground system and enables the passenger to visualise the working of the whole system of tubes with their controls and safety devices. RONTGEN'S discovery did much the same for the human alimentary canal although he did not live to see to what extent it was to revolutionise medical practice; and indeed the revolution is by no means yet complete. For the first 15 years the radiologist was relying entirely on the varying atomic weights of the chemical components of the body to differentiate them on the screen; an X ray picture then showed little more than the skeleton within the soft parts. The introduction of the opaque meal about the year 1906 opened up the possibility of examining the working of all the tubular systems in the body; bismuth and barium have revealed the alimentary canal, iodine has clearly shown lesions in the genito-urinary system, the bronchi, and the spinal canal, and has made a start with the circulating blood, and what the future will bring forth only a brave prophet would say. In a paper read not long ago before the Society of Radiographers, Dr. A. E. BARCLAY remarked that the surface markings of the abdominal contents as they are now charted in students' text-books are hopelessly wrong. The living conception of the position and movements of the viscera made possible by the use of the opaque meal has shown that the shape of the viscera depends on the tonic action of the muscles which so largely compose them, that their shape varies from person to person and indeed in the same person from day to day or hour to hour. Thus the lower border of the shadow of an apparently normal stomach may be seen to drop perhaps 3 or 4 inches because of the sudden banging of a door or by the advent of nausea or giddiness. The radiologist, said Dr. BARCLAY, was inevitably struck by a lack of uniformity in the relation of the extent of the disease to the symptoms to which it gives rise. Radiology had wiped out quite a large number of text-book diseases of the stomach, each with its own set of symptoms, and only two common chronic diseases of that organ remained—namely, ulceration and cancer. For the rest, the stomach was the spokesman for the other abdominal viscera; they were apt to refer their grievances to the stomach for expression, and with the help of bismuth or barium (the Manchester Royal Infirmary alone uses about three-quarters of a ton of barium sulphate in the year) such vague complaints as nervous dyspepsia and gastritis were now referred to their place of origin in the gall-bladder, the duodenum, or elsewhere.

This revolution in our knowledge of visceral function has not only required steady devotion on the part of its adherents but has involved an outlay of money in apparatus such as no other branch of medicine involves. The equipment of the radiologist is expensive to start with and it rapidly depreciates in value as new methods are worked out. For this reason, although radiology in private hands holds a bright prospect (Dr. G. B. BATTEN estimates that a population of 50,000 is sufficient to maintain a whole-time radiologist), it may be desirable, as Dr. FRANGCON ROBERTS suggested in our own columns three weeks ago, to centralise the apparatus. He has gained the impression that radiologists in this country have no desire to burden themselves with their own apparatus if they can have the use of installations at hospitals or central institutes. In Germany it seems the equipment and organisation for radiology have made enormous strides; the municipal hospital at Frankfort-on-Maine has an institute which has cost £2 14*s.* per cubic metre, an expense which was defrayed partly by the State and partly from the central pool of sickness insurance. Dr. ROBERTS points out quite fairly that provision for radiological diagnosis and treatment under the Insurance Acts would go far to solve the needs of radiology in this country, while the claim for State support has been strengthened by the Local Government Act of 1929 which requires voluntary hospitals to provide X ray facilities for other hospitals in the area.

The fruits of radiology will not be garnered until the practitioner realises its value to him in the daily treatment of his patients, and until the eyes of patients themselves are opened. It may not be possible for every general consultant to have an X ray installation in his consulting-room and to regard no clinical examination as complete without a view of the thoracic and abdominal organs on the fluorescent screen. As soon as he has to rely on a specialist the trouble begins; dissatisfaction with the X ray operator has been often enough expressed. One of the discussions at the recent Radiological Congress gave the radiologist the opportunity of pointing out the many types of unsatisfactory clinician met with at the present time, ranging from those who regard radiology as a joke or as an unimportant aid to diagnosis, to those who wish to interpret their own radiograms or to have them interpreted without reference to the patient's symptoms. There must be an increasingly sharp distinction, as a correspondent remarked in a letter to our columns on Nov. 30th last, between those who know what radiology will do and those who can actually take the films; but the practitioner, it seems, has little means of learning what it will do and therefore does not seek its aid. How this state of affairs is to be rectified engaged a good deal of the attention of the Congress, and the British Institute of Radiology may well have a part to play in organising post-graduate classes on the place which electrical methods and especially radiology may play in medicine. The National Insurance Fund might help by providing panel practitioners with facilities at least for learning what radiology will do, and there is a place for the endowment of chairs and lectureships in radiology. We have no reason to doubt the correctness of Dr. ROBERTS'S impression that the special claims of radiology for State support have never been presented, or at all events presented adequately.

DOCTORS AND LOCAL AUTHORITIES.

THE question how far medical practitioners are disqualified from membership of local authorities requires fresh consideration in view of the impending changes caused by the new Local Government Act. The Minister of Health has sent Dr. VERNON DAVIES, M.P., an important memorandum on the subject, not only explaining what he understands to be the law, but also hinting at future changes on a matter dealt

with in the Final Report [1] of the Royal Commission on Local Government, which has just been issued.

The broad principle is clear. Anybody who has a contract, or is interested in a contract, with a local authority is disqualified from membership of that body. As the Minister points out, this is a general rule, applicable to employees of all kinds, solicitors, architects, and engineers, for instance, as well as doctors. One of the consequences of the new Act is to transfer numbers of officers and employees from one local authority to another. A medical practitioner may thus find himself the employee of a local authority of which he is a member; if so, he is automatically disqualified from further membership. In one respect the situation may be simplified under the new Act, for part-time medical employment will, in some degree, be giving way to whole-time employment. It needs no legal knowledge to appreciate that a whole-time servant cannot be simultaneously a master; obviously he will be debarred from membership of the body he serves. In other directions matters are not so easy. In the eye of the law the elements of a contract are present whenever a doctor does any professional work for which he receives a fee from a local authority. Parliament has recognised and remedied this difficulty in certain well-known cases where the work is of a minor or routine nature. It is specially enacted, for instance, that a doctor sending a certificate of an infectious disease (and receiving a fee therefor) shall not be disqualified from membership of the local body on that account. Similarly, there is a rule that a doctor attending a confinement on demand from a midwife, and consequently receiving a fee under the Midwives Act of 1918, is not disqualified. This ruling is not directly statutory, but is based on the technical subtlety that the doctor is not taking a fee under a contract of employment with the local authority, but that the authority is fulfilling a statutory obligation in paying him a fee for work done in special conditions contemplated by statute. Outside these specific exemptions two important classes of cases are mentioned in the Minister's memorandum. On the one hand, there are the doctors who work under a contract for occasional service—e.g., attendance at a maternity and child welfare centre, with remuneration at specified fees. The Minister states definitely that these practitioners are disqualified by the contract though it seems that the Royal Commission's Report looks for the removal of the bar. On the other hand, there is the class of cases where a local authority makes payments to a hospital with the result that a physician or surgeon working at the hospital receives some part of the payment. In these cases, says the Minister, disqualification depends upon the particular facts—in other words, the medical practitioner is left to act at his own risk, and to find out his legal liabilities in a court of law.

The situation can hardly be deemed satisfactory. The local administration of health services is not the monopoly of the medical profession. Equally it is not a form of public work to which the medical profession should be prevented from making any independent contribution whatever. Teachers, it is understood, are represented in the deliberations upon local education schemes. There seems no sense in excluding the doctor from deliberations upon health matters merely because he may find himself performing some individual service for which the local authority may pay him a fee, or because he is on the rota for duty at a maternity and child welfare centre, or is consultant to some institution rendering public assistance. The views of the Royal Commission demand serious attention. The Commissioners, it may be surmised, do not think it an advantage, either to the medical profession or to the country, that members of the profession should be barred by law from the opportunity of participating in public work as members of local bodies. Insistence upon disinterestedness is proper and in accordance with our best traditions; but where interest intervenes casually and as it were by accident, insistence need not be a fetich. A High Court judge is not thought incapable of trying an action against a railway company because he happens to be a shareholder. He mentions the fact and inquires if the parties object to his jurisdiction on that account; no objection is ever taken. If similar confidence were reposed in a medical member of a county or borough council nobody would assume that it would be misplaced. The medical member would naturally not take part in discussions or decisions affecting his own fees or professional services if any such question ever arose. In all else he should be free to coöperate with his fellow-councillors. The fact that he knows what he is talking about should not necessarily be a disqualification.

[1] H.M. Stationery Office, Cmd. 3436, 1929, pp. 169, 3s., see p. 157.

INDIA AND THE G.M.C.

FOR some time past it has been apparent that the relations of the Indian universities with the General Medical Council were becoming increasingly strained and that recognition in the United Kingdom of their medical degrees was hanging in the balance. At the November session of the Council Sir DONALD MACALISTER made it clear that matters had reached a crisis; in his Presidential address he gave a brief summary of the course which the Council had taken since 1922 when it was first found necessary to draw attention to certain deficiencies in Indian methods of training and examination. It has never been denied that excellent work has been put into the various medical colleges in the past, and originally, in many respects, their facilities compared favourably with those of similar institutions elsewhere. This was made evident by the high honours which some of their students obtained periodically in British examinations. But, as at home, conditions changed for the worse during and after the war, owing to the overcrowding which was inevitable at that time, and it was a matter of common knowledge that schools with twice the normal number of students were working with facilities which had been little if at all expanded since the war. The deficiency which first attracted attention was in midwifery, a subject in which it has always been difficult to arrange for practical instruction in India, but it has since been shown that clinical material for other subjects was inadequate during this period.

When these deficiencies came to their notice the General Medical Council very reasonably drew attention to them, pointing out that in its capacity of guardian for the British public it could not overlook obvious shortcomings of this character, if Indian graduates were to be allowed to practise in the United Kingdom. The line taken by the Council, as Sir DONALD has stated, was that India should herself give some guarantee of uniformity of standards, the best means to this end being the creation of an All-India Medical Council, which would be responsible for the regulation of medical education and registration in India, in much the same way as the General Medical Council is responsible at home. Provincial medical councils already exist, and these would presumably continue in some form, but it was evidently thought that under present conditions they could not provide

adequate assurance of the maintenance of uniform standards. The Council recognised, however, that the establishment of a central body would take time, and in order to allow for a period of reconstruction it asked that an inspecting officer should be appointed, to keep the Council informed of the condition of the various schools and the standard of examinations. The proposal was accepted, and an inspector, appointed by the Government of India, for some time kept the Council in touch with the schools. Incidentally, with a certain amount of discussion—and sometimes it must be confessed with some friction—various improvements designed to bring the Indian schools more or less into line with the revised British curriculum were introduced, and with one or two exceptions recognition of the Indian degrees for practice in the United Kingdom was maintained, and extended from year to year, pending a more permanent solution of the difficulties by the constitution of an All-India Council. The negotiations can be followed in detail in the minutes of the G.M.C.; suffice it here to set out the way in which they finally broke down. Regular inspections by a single approved official having lapsed, the Council has asked to have them reintroduced, and has further pressed for the setting up of an All-India Council. Both provincial and central governments, recognising the gravity of the situation, agreed to the reappointment of an inspector, and the same officer who had carried out the duties previously, and whose experience made him the one man suitable, was kept in readiness for the post. Arrangements for introducing an All-India Medical Council Bill, which had been for some time under consideration, were completed, and a draft was brought to the notice of the authorities concerned. What is the result? The proposal for the appointment of a Government commissioner of medical qualifications and standards evoked strong criticism from the nationalist members in the Legislative Assembly, and it was found necessary to postpone its consideration to a later session. The preliminary negotiations for the formation of an All-India Council got no further. The captious nature of some of the arguments against the appointment of an inspector may be judged from the fact that one speaker objected on the score that the officer proposed belonged to the Indian Medical Service, while another—one of the most prominent Hindu leaders—spoke of the disrespect which such a proposal involved to the Indian universities. He would rather, he said, close the universities than have them submit to such an indignity, and he would welcome the day when British registration of Indian degrees was considered of no value. There was also a good deal of wild talk of medical dictators and the tyranny of the British—i.e., the General Medical Council.

The issues at stake are undoubtedly grave, involving, if only Indian educational and political leaders would realise it, not merely the recognition of Indian degrees in Great Britain, but their standing everywhere outside India also. The G.M.C. has exercised patience to the utmost limits; in spite of frequent misrepresentations it has been the best of friends to the provincial councils in India, which were founded largely on its example and advice. Time and again Sir DONALD MACALISTER has made it clear that the Council is not concerned with the standard deemed sufficient for practice in India, but only with that which it is required by law to enforce for medical practice at home, and it is easy to imagine that nothing would please the Council better than to divest itself of all responsibility for Indian affairs. The matter, however, is of such deep concern to India that we trust the Council will continue to exercise the patience and forbearance it has shown so abundantly in the past. The more sober sections of Indian opinion will no doubt realise the importance of a link which the extremists are so eager to cut. They will see that recognition once lost may be very difficult to regain, and we may hope that even at the eleventh hour some acceptable plan may be arrived at. The creation of an All-India Medical Council cannot injure national susceptibilities, it will increase national prestige; while the appointment of an inspecting officer is a temporary expedient to fill in the interval before it is appointed. But the time for action on either side is short if, as now appears, recognition is not to be extended beyond February in the absence of the required reports. It would indeed be lamentable if all the efforts of administrative officers, and other people of goodwill both in England and India, were to be rendered null and void by a few words spoken in the heated atmosphere of the Legislative Assembly.

Annotations.

"Ne quid nimis."

NEW YEAR HONOURS.

THE following is the list of New Year Honours as far as they directly relate to the medical profession. It was issued on the last evening of the old year. No medical names are to be found among the new peers or baronets.

G.C.B.

Surgeon Rear-Admiral Robert William Basil Hall.

C.B. (Military Division).

Major-General David Harvey, C.M.G., M.D., K.H.S. (late Royal Army Medical Corps), Director of Pathology, the War Office.

Colonel Arthur Brownfield Fry, C.I.E., D.S.O., M.D., Indian Medical Service, Assistant Director of Medical Services, Presidency and Assam District, India.

K.C.M.G.

Sir James Crawford Maxwell, M.D., K.B.E., Governor and Commander-in-Chief of Northern Rhodesia.

Lieut.-Colonel Andrew Balfour, LL.D., M.D., C.B., C.M.G., Member of the Colonial Advisory Medical and Sanitary Committee, Director of the London School of Hygiene and Tropical Medicine.

C.I.E.

Lieut.-Colonel Walter Valentine Coppinger, D.S.O., M.D., F.R.C.S.I., I.M.S., Inspector-General of Civil Hospitals, Central Provinces.

Lieut.-Colonel Arthur Francis Hamilton, M.B., F.R.C.S., I.M.S., Professor of Midwifery, Grant Medical College, Bombay.

K.C.V.O.

Russell Facey Wilkinson.

C.V.O.

Sir George Washington Badgerow, C.M.G., M.D., F.R.C.S.
Herbert Stanley French, C.B.E., M.D.

G.B.E. (Military Division).

Surgeon Commander William Innes Gerrard, M.B., D.P.H. M.R.C.P., R.N.

K.B.E. (Civil Division).

The Honourable Stanley Seymour Argyle, M.B., lately Chief Secretary and Minister of Public Health, State of Victoria.

O.B.E. (Civil Division).

William Alfred Stedwell Lamborn, M.R.C.S., L.R.C.P., Medical Entomologist, Nyasaland Protectorate.

Harold Armstrong Crouch, M.C., Medical Inspector, Upper Nile Province, Sudan.

Charles Johnston Smith, M.B., Senior Surgeon, Singapore.

M.B.E. (Civil Division).

John Young McFadyen, M.D., Magistrate and Medical Officer, Anguilla Island, Presidency of Saint Christopher and Nevis.

Knight Bachelor.

Prof. Temistocle Zammit, C.M.G., M.D., D.Litt., Curator of the Museum, Malta.

Kaiser-i-Hind Medal.

Miss Mary Longmire, M.B.

The following names will be recognised with pleasure in the list, as their owners in different capacities have worked in relation to medicine in one aspect or another.

Sir Gregory Foster, late Provost of University College, London, has been created a baronet. Mr. L. L. Cohen, hon. sec. to King Edward's Hospital Fund for London, receives the K.C.V.O. Miss Gertrude Tuckwell, a member of the Women's Central Committee on Women's Training and Employment, receives the C.H. Major-General William Samuel Anthony, C.M.G., Director-General, Army Veterinary Services, is created C.B. Prof. J. S. S. Brain, professor of chemistry at the R.N. College, Greenwich, receives the C.B.E., and Mr. E. S. Russell, D.Sc., of the Ministry of Agriculture and Fisheries, receives the O.B.E. The M.B.E. has been conferred upon Miss Elsie Hughes, secretary to Lord Dawson of Penn, for services rendered during His Majesty's recent illness, and the same distinction has been conferred upon Mr. D. H. J. Nicholas, in charge of the Government House Dispensary, Madras.

The O.B.E. (Civil Division) has been conferred upon, Miss Helen Grace Palin, principal matron, Ministry of Pensions Nursing Service, and Miss Lily Richards, matron, Royal Westminster Ophthalmic Hospital, while Miss Ethel Harrison, superintendent of the Northrup McMillan Nurses' Institute, Kenya Colony receives the M.B.E.

The following names among the nursing profession are included :—

Royal Red Cross 1st Class.—Superintending Sister Nita Courtice.

Superintending Sister Marguerite M. Abraham.

Royal Red Cross 2nd Class.— Nursing Sister Leonora C. Hooper.

Nursing Sister Alice M. Shrewsbury.

THE CHANGES IN THE HOSPITAL SYSTEM.

JANUARY will be an important month in relation to the arrangements, often difficult and complicated, for the taking over, under the new Local Government Act, by county councils and the town councils of county boroughs, of institutions hitherto belonging to poor-law authorities. In self-contained areas the operation will be simple enough; the complications come in when the areas of these institutions are not wholly comprised within one county or county borough. When this happens the councils affected, which may be more than two, will have to come to an agreement. A fair number of such agreements have been reached, but many are still outstanding, and the sands are running out. If these adjustments are not made by the end of the present month they will be made by the Minister of Health, whose Order might conceivably take a form not altogether pleasing to one or other of the authorities concerned. The Ministry of Health has laid stress upon the obvious desirability and convenience of the ownership of transferred institutions being vested in one council, and it is here that friction seems most likely to arise. Happily, goodwill appears to be in the ascendant, and we may therefore hope that troublesome details will get themselves settled without an aftermath of local jealousy.

Good progress appears to have been made in the constitution of the Public Assistance Committee upon which so much hard work will fall. In a number of instances, however, councils have taken the view, which they are perfectly entitled to take, and act upon, that only elected representatives of the ratepayers ought to serve on these bodies. Nevertheless this view will probably be found, by experience, to be short-sighted. By no means every elected councillor has been a guardian, and intimate knowledge of poor-law work on the part of those who will in future have to administer it is surely essential. Education committees are almost invariably "stiffened" by the coöperation of experts, and the power to coöpt is one of the most useful of the liberties accorded by the Act. Some complaints are also made of the insufficient representation of women on the committees. Women long ago became expert guardians, and there would seem to be wide scope for their help, also on the hospital side of public assistance. Upon certain subcommittees they are bound to be placed, but it is desirable that they should have a voice in that shaping of general policy which will be the work of the main body. It is hardly to be expected that a great new system, some of the implications of which are as yet obscure, should "shake down" at once. Experience, especially in the vitally important matter of coöperation between the public assistance hospitals and the voluntary hospitals, will be gained gradually, but meanwhile, so far as a general survey of the field is possible at this juncture, there appears to be an entire absence on the part of the county and town councils of any desire to interfere with the control of the voluntary hospitals.

The latter are, indeed, in so strong a position that there seems to be little ground for the fears that have sometimes been expressed, that they might be swallowed up. The simple fact that they are entitled to be consulted upon developments proposed by the councils, but are not called upon to consult the councils upon their own development, should be an almost complete safeguard. It is to be hoped, however, that there will be no mere standing upon dignity, no insistence upon the letter of the law in this highly important matter. The whole future of the new hospital system will depend upon constant good understanding and systematic well lubricated coöperation between the voluntary hospitals and those administered by public authorities. Not otherwise will it be possible to derive the fullest advantage from a change which aims at coördination and interchange, although not at technical fusion. Any general lack of understanding would have deplorable results, not the least deplorable of which would inevitably be a large degree of that bureaucratic interference which would be the worst of menaces to the voluntary system.

POSTURE IN HEALTH AND DISEASE.

SOME of the principles which govern the actions of the joints and muscular systems of the body were expounded by Miss M. Forrester-Brown in an address delivered to the London Association of the Medical Women's Federation on Dec. 16th. She held that these were not well understood either by general practitioners or by medical gymnasts. It was not generally realised that the normal spinal column is not equally mobile in all its joints. X rays show that extensor movements occur chiefly in the lumbar and cervical regions, and that there is a fixed kyphos in the thoracic region with its maximum at the seventh vertebra. Back-bending exercises, she said, increase rather than reduce this kyphos, and only under pathological conditions or in acrobats can it be reduced to lordosis. Other useful observations made by the lecturer are the following: The number and shape of the vertebræ exhibit considerable variation within normal limits. In the lumbar region four vertebræ may be present in an individual of stocky build, and five deep vertebræ are commonly found in slender, long-backed subjects, who tend to become visceroptotic and are always unsuited to heavy physical work. Ill-health may often be prevented by the choice of work to which the individual's physical type is best adapted. Muscles are more important than ligaments in affording support to joints. The tone of muscles depends on an intact reflex arc, and is diminished by fatigue in the central nervous system, and not by fatigue in individual or groups of muscles.

The effects of emotion on posture are illustrated by the typical attitudes assigned to fear, deceit, courage, and triumph, and, according to Miss Forrester-Brown, the effects on a child's temperament of treating faults in posture are often striking. The slouching child is often a sulky child. When judicious use of a long mirror makes the child realise the unsightliness of

her posture, he or she can often be stimulated to take an interest in the treatment; it is when the patient coöperates with enthusiasm that the best results can be obtained. The attitude of the spine depends on the tone of the vertebral and abdominal muscles and on the tilt of the pelvis. The position of the head is relatively unimportant in connexion with good posture, for the reflex motor system is at peace provided the eyes are horizontal. That this effect can easily be achieved with a faultily held spine is evident in many tuberculous lesions of the spine where gross deformities are present. Good posture depends chiefly on good balance, and in maintaining this the spinal and abdominal muscles are of equal importance; factors such as warm air, tonsillar infection, and chronic constipation, which lower their tone, are responsible for bad posture in many children. The child living in a civilised community certainly suffers in several ways by being deprived of the stimulus of cold air and sunshine on the body, and the provision of these stimuli is an important factor in treatment.

The treatment of faulty postures, said Miss Forrester-Brown, are rest, fresh air, massage, and exercises, with correct breathing as an important adjunct. Mobility rather than depth of chest should be aimed at; the well-developed puffed out chest is not the ideal inspiratory position. When inspiration is carried out with both arms raised the muscles attaching the arms to the chest wall are shortened, the play of the ribs inhibited, and movements of the diaphragm diminished. Since diaphragmatic respiration represents a larger volume of air than thoracic respiration, so-called "abdominal breathing" should be taught to children in the recumbent position, and the shoulder-shrugging and leg-bending exercises should also be done in this attitude. The value of recumbency to the growing child is not nowadays generally appreciated. The Victorian principle of resting on a back-board was, in Miss Forrester-Brown's view, a sound one, and the teaching of deportment should be advocated. The country dancing now popular makes for a sense of rhythm, but does not inculcate balance, control of movements, and grace, as did training in the old court dances. Faulty sitting postures are common in school-children, and result in crowding of the ribs and sagging of the abdomen. Sitting in a straight-backed chair causes less fatigue if a small pillow is placed in the small of the back to support the natural lumbar lordosis. Such a pillow should be used also during operations in the Trendelenburg position. Its support of the sacro-iliac joint should prevent the post-operative pain in the leg which is caused by pressure on the nerves as they pass through the foramina.

CAUSES OF BALDNESS.

THE problem of common baldness is still more or less unsolved, and in its treatment we have made scarcely any progress of importance since Unna attributed the condition to infection by the organisms of seborrhœa. This explanation is evidently not the whole story; protracted and conscientious application of sulphur, which remains our most potent remedy for seborrhœa, is rarely successful in promoting a cure, although it is of undoubted value if begun early in life when excess of scurf is first noticed. In a recent post-graduate lecture[1] in Vienna, R. O. Stein pointed out that seborrhœa is common in African natives, and yet the bald man is seldom seen among them. Clearly there are other factors at work besides infection, and no one can fail to be struck by the close association of the state of the hair and the state of endocrine metabolism. In his first Lettsomian lecture last year Dr. H. W. Barber[2] said that "virility tends to loss of hair on the scalp with its increased luxuriance on the beard and body; feminism to a converse distribution." Sabouraud states that eunuchs are seldom if ever affected by the male type of baldness, and women, of course, show a similar immunity, which can be disturbed by endocrine disease. Dr. Barber mentioned a case in which a woman with a suprarenal tumour grew a beard and moustache, and went bald like a man. When the tumour was removed the hair on the face fell off, and the scalp regained its covering, but the signs of virility again returned with recurrence of the tumour. It is, perhaps, something of an anti-climax to recall that popular belief attributes baldness to the wearing of a tight hat—a view which is shared to some extent by dermatologists. W. A. Pusey[3] has lately remarked that "in the common occurrence of baldness we have a manifestation of a transitional stage in man's evolution..... Man now uses a hat instead of relying upon a shock of hair as his ancestors did..... This does not mean that we can save our hair by discarding our hats. We are a result of our ancestors, and to save our hair we should have to discard the hats of all our ancestors for scores of generations back." There is a certain amount to be said for this "vestigial" ætiology of baldness, but it has to reckon with a persistence of the axillary and pubic hair, which has survived in spite of all our clothing. Every theory yet devised has its weak spots, and at present it looks as though alopecia presenilis would long continue to embarrass the profession and enrich the advertising quack.

[1] Wien. klin. Woch., Nov. 21st, 1929, p. 1510.
[2] THE LANCET, 1929, ii., 369.

RUMINATION IN MAN.

Three hundred years ago Jerome Fabricius of Aquapendenta recorded the case of a young man who began to ruminate through worry because his father's forehead had suddenly sprouted horns—a state of affairs calculated to disturb even the least filial. Dr. Charles-Francis Long, who quoted this story before the College of Physicians of Philadelphia, has collected[4] six cases exhibiting the phenomenon of rumination, and has investigated some of them radiographically, with a view to determining the mechanism of the act. Three out of the six subjects were Russian Jews, and all were of the fidgetty and neurasthenic type. Only one appears to have appreciated the commercial value of his condition, and he was an Egyptian who publicly performed prodigies of swallowing and regurgitation, finishing regularly with half a pint of kerosine, which was expelled in jets over a lighted candle, and produced a series of spurts of flame. Most ruminants, Dr. Long discovered, were hasty and large eaters, and were at great pains to conceal their ruminating faculty from their friends and relations. The food usually returned to the mouth without effort, 15 to 30 minutes after the meal, in the state in which it was swallowed, and could be re-masticated; the process stopped automatically as soon as the food began to taste sour. Most of the patients derived considerable pleasure from the second mastication, one of them insisting that it doubled the enjoyment of a good dessert. In most cases there was no selective power over the type of food returned, though the Egyptian actor claimed to have this faculty. The hereditary aspect has been stressed by other writers, but Dr. Long found evidence of this only in the family history of the actor. Rumination in the cow, as investigated by Toussaint 50 years ago, is, he says, associated with reduction in the intrathoracic pressure, and aspiration of the food out of the passive rumen. In the two cases which Dr. Long examined radiographically no evidence was found of an analogous mechanism in human ruminants, except that, as with herbivora, the act was preceded immediately by one of swallowing, which induced relaxation of the cardia. In the first case examined radiographically the stomach showed a functional hour-glass constriction, and when rumination occurred the food was squeezed out of the upper pole by a general contraction of the muscle wall. In the second case, which was that of the actor, the stomach was enormously distended, and some of the barium passed through into the small intestine. The stomach was apparently emptied both by contraction of the

[3] Care of the Skin and Hair. New York, 1929, p. 164.
[4] Amer. Jour. Med. Sci., December, 1929, p. 814.

abdominal muscles and by generalised contraction of the whole stomach wall. The lower end of the œsophagus during the act showed a series of rhythmic contractions and relaxations; no peristalsis or reverse peristalsis was observed in the intestine. That this man was not a case of voluntary vomiting was shown by the history, which was that of a ruminant who had developed his peculiar faculty to the utmost, and by his capacity for controlling the amount of food returned.

GRATUITOUS SPLINTS AND SURGICAL APPLIANCES.

THREE months ago we brought the fact to the notice of many whom it interested actively that the Government contractors, Messrs. A. Fleming and Co. (39, Victoria-street, London, S.W.) had on their hands a stock of splints and kindred appliances taken over from the R.A.M.C. stores at the termination of the war. The contractors informed us then of their intention to give away free of charge to hospitals, infirmaries, and similar institutions large quantities of this stock which was all new and, though sometimes store-soiled, in thoroughly serviceable condition. The contractors are repeating this offer, as, although over 2000 splints of various types and patterns have been distributed and applications have been received from places as far away as China, the supply available is not exhausted. We learn from them, however, that inquiries are still being received for the appliances, and for particulars of the generous scheme of Mr. Alfred Fleming—for it is he who has been personally responsible for distributing the material which was purchased by him from the Government. The following apparatus is held at the disposal of suitable applicants:—

Leg and thigh splints, wood, Liston's pattern, in sets of three, with and without footpieces.
Extension apparatus, Guy's pattern, complete with clamp, shot can, pulley and cord.
Arm extension splints, with leather padded swivel ring. Sinclair's modification of Thomas's knee splint.
Back, leg, and thigh splints, Nevill's pattern, white enamelled iron. No pads or straps available.
Footpieces, wire, for use with Thomas's leg splints.
Footpiece supports, iron, for use with Thomas's leg splints.
Leg splints, Thomas's, large with leather padded fixed ring.
Pattens's japanned iron, for use with Thomas's leg splints.

The scope of the donations, which were originally confined to hospitals (including homes for cripples) and infirmaries, is now enlarged and the offer is extended to establishments where training is given in first aid, and we are authorised to say that a large number of splints and other appliances can be disposed of in this generous way free of charge provided the recipients pay the carriage from the depot at Portsmouth to their own door. To institutions which have not taken advantage of this offer we bring it to their notice, for the need for surgical appliances must surely have increased with the increasing number of road accidents through motor traffic. To many institutions whose geography has exposed them to the expense of dealing with these accidents the chance for replenishing a heavy drain on their stocks will be welcome.

SPEECH AND INTELLIGENCE IN CHILDHOOD.

WHERE there is any question of retarded development it is important to find out just when the various bodily functions have been acquired; for these milestones of infancy and childhood often afford the only reliable evidence bearing on the onset of defects. Certain of them, such as the times of sitting, standing, walking, and talking are so constant as to furnish useful information. Others, such as the acquisition of sphincter control, are much more variable, and it is usually thought inadvisable to attach diagnostic importance to them. Of all the milestones which are of practical value, the beginning of speech is perhaps the most important, but it is also the least easy to recognise, because of the long time between early essays and finished perfection in this art. Taking the onset of speech to mean the age at which the child "utters a sound with full consciousness of its meaning and for the purpose of communication," Prof. Abt and co-workers [1] have made an extensive investigation into the records of 1000 cases examined at the Institute for Juvenile Research at Chicago, where the age of onset of talking, walking, and bladder control, the mental age and intelligence quotient (I.Q.), and other data have been recorded. The investigation was intended to apply to children whose faculties were within normal limits, and cases with gross mental defect, deafness, or anatomical abnormalities were discarded, as also were those concerning whom the replies were unduly vague. Analysis of these records showed a very close correspondence between the age of onset of speech and the I.Q. at the time the child was seen; but there was great variation in the ages at which the children were examined. The chart in which this correspondence is graphically displayed suggests that the higher the (subsequent) I.Q. the earlier the child learnt to talk. Very similar results were obtained by comparison of the general intelligence with the age of onset of walking. It has been stated that the ordinal position of the child in the family has an influence on the age of onset of speech—the younger ones reaping an advantage from their opportunities of imitation; but Abt and his colleagues failed to find any evidence of this influence. From the records of a small group of cases it appeared that prematurity was also without influence on speech. It was found, however, that the average age of learning to speak was considerably lower (17 months) in the group of children who had acquired sphincter control at 3 than the corresponding age (21 months) in the group which had not. The conclusions drawn from this interesting study are mainly consonant with the views most commonly accepted in this country, except that so close a correspondence between the onset of speech and of bladder control has not perhaps been recognised here. When applying the conclusions to clinical problems it should be borne in mind that the writers of this paper were investigating the *average* and not the *normal*. A point which remains unsettled, and on which opinion differs a good deal, is the extent of variation which constitutes pathological retardation sufficient to have a prognostic significance. All cases with physical defects were wisely excluded from the American series. The difficulties presented by deafness are well known, but one of the commonest causes of error in diagnosis and prognosis is the application of speech development as a test of intelligence in children who have suffered cerebral damage.

SLEEP AND INTRACRANIAL PRESSURE.

SOME investigations of the relationship between sleep and intracranial pressure have recently been reported by Stevenson, Christensen, and Wortis,[2] who have studied variations in the intracranial pressure in five patients who had a cranial defect resulting from operation. They employed an apparatus consisting of a closed air tambour system under a positive pressure of about 12 mm. of mercury. One tambour was strapped and bandaged over the brain hernia, and the other was attached to a light-weight pointer which registered on a smoked drum changes of intracranial pressure produced by the pulse, respiration, sleep, and the administration of certain drugs. A number of observations were made upon patients during the period of falling asleep and of awakening. The tracings constantly showed a rise of pressure associated with falling asleep and a fall of pressure corresponding to awakening. The effect of administering certain drugs was very interesting. Morphia was found to cause a rise in intracranial pressure and caffeine a fall. The authors are

[1] Abt, I. A., Adler, H. M., and Bartelme, P.: Jour. Amer. Med. Assoc., 1929, xciii., 1351.
[2] Stevenson, L., Christensen, B. E., and Wortis, S. B.; Amer. Jour. Med. Sci., November, 1929, p. 663.

influenced by their observations to lay stress upon changes in intracranial pressure as playing an important part in the causation of sleep and of awakening. They attribute sleep to a periodical fatigue of "sympathetic centre in the brain which maintains vasomotor tone in the vessels." This is assumed to produce a vasodilatation of the blood-vessels of the brain as a result of which the brain volume becomes increased "with a consequent falling apart of the neurons." The pressure of the cerebro-spinal fluid within the brain is also increased and this may alter the conductivity of the synapse. This mechanical view of the nature of sleep can hardly be reconciled with the conception of sleep as inhibition which Pavlov has proposed. Stevenson and his colleagues assume that the changes in intracranial pressure which accompany sleep and awakening are themselves causative factors of these changes of state. It may, however, be assumed with equal justification that the changes in intracranial pressure are secondary to the onset of sleep and its cessation. The latter view is supported by the fact that although pathological states of increased intracranial pressure are sometimes associated with drowsiness this is by no means always the case. Further, even if we accept the existence of the hypothetical sympathetic centre controlling the tone of the cerebral blood-vessels we have still to explain its periodical fatigue. It is doubtful, then, whether the purely mechanical view of the nature of sleep can be accepted. Nevertheless, the experiments reported are of considerable interest to those who are concerned with pathological variations in the intracranial pressure. The observation that caffeine lowers the intracranial pressure may have practical value in treatment and may explain the benefit derived from its use in such conditions as migraine. Diuretin has already been used by Marriott in the treatment of hydrocephalus in children.

RECTAL EXAMINATION IN LABOUR.

ALTHOUGH used as a routine in certain foreign clinics for upwards of a quarter of a century, rectal examination in labour has never been widely adopted in this country. The reason probably is that few British obstetricians have been convinced that the greater safety from puerperal sepsis compensates for its obvious disadvantages. The subject has lately been considered anew by La Vake,[1] and the advantages he claims for rectal examination, which he has used regularly since 1913, are briefly as follows: (1) There is no risk of introducing bacteria into the vagina. (2) Repeated examinations can be made in all types of surroundings without increase in danger. (3) The time of the attendant is saved because no elaborate preparations are required before examination. (4) In over 95 per cent. of cases that will end spontaneously, the rectal and abdominal examinations give all the data needed for diagnosis. (5) After rectal examination any operative interference can be undertaken with the assurance that pathogenic organisms have not been introduced into the vagina. (6) Absence of vaginal examination increases the confidence of the patient and the medical attendant. With regard to technique, La Vake points out that care should be taken to avoid soiling the external genitalia and that the thumb must be kept away from the vulva. He admits that investigation per rectum is more difficult for the student to master than investigation per vaginam, but he thinks this is more than offset by the much greater frequency with which it can be done. The best way to start the teaching of rectal examination is to begin in the gnyæcological and out-patient department "where on all gynæcological, and on all pregnant patients in the early months, the recto-vaginal examination may be made and the student can check up his rectal findings by his findings with the vaginal finger. . . . . Rectal examinations alone of patients in the last six weeks of pregnancy, especially in multiparæ, are most instructive, because in many of these cases the presenting part is easily felt and obliteration of the cervical canal and even dilatation has in many instances gone far enough to be distinctly manifest."

It would have been of great interest had La Vake given details of the incidence of sepsis in his clinic during the 16 years that rectal examination has been practised. He is content, however, with the general statement "each year's experience in all types of situations and conditions has added to my conviction that the rectal examination is potentially the safer examination, and the vaginal examination under the most meticulous aseptic technique should be used only when the rectal findings leave one in doubt. It is my belief that the universal teaching and use of the rectal examination. . . would reduce the incidence of postpartum sepsis." The figures he quotes from other clinics tend to support, but certainly do not prove, this contention. Guggisberg, at Berne, employed vaginal examination from 1901 to 1911 in 4642 cases; in 17·5 per cent. the temperature reached 37·5° C. (99·5° F.), genital infection occurred in 11·2 per cent., and death from sepsis in 0·12 per cent. From 1912 to 1921 3010 cases underwent rectal examination only; the temperature reached 37·5° C. in 11 per cent., genital infection occurred in 5·5 per cent., and there were no deaths from sepsis. The balance here was decidedly in favour of rectal examination. In a similar study by Reis, the number of cases was smaller, but they were all seen in one year (1924), and the conditions in the two sets of cases were more likely to be comparable; 609 cases were examined by the vagina, 271 by the rectum, and 106 not at all. The pelvis was infected in 6·3 per cent. of those rectally examined, in 5·9 per cent. of those examined vaginally, and in 4·7 per cent. of those who had no examination. Reis also tabulated his cases according as they were febrile or afebrile; any patient showing more than half a degree rise of temperature at any time during the first seven days after delivery was considered for the purpose of this investigation as being febrile. Comparing the cases delivered spontaneously, it was found that of those who had rectal examination 54 per cent. were afebrile; of those examined vaginally, 57 per cent. were afebrile, while of those who were not examined either vaginally or rectally, 64 per cent. were afebrile. Reis therefore concluded that the percentage of absolutely afebrile cases is definitely increased when neither rectal nor vaginal examination is made, and conversely that the percentage of pelvic infection is definitely decreased, but that there appears to be "practically no difference between the group examined vaginally and the group examined rectally."

On the whole no strong case seems to have been yet made out on behalf of rectal examination. Possibly the question can never be decided until we have a final pronouncement on the pathogenicity of the flora of the normal vaginal canal. If the organisms normally present are either actually or potentially pathogenic, then rectal examination might be as effective as vaginal examination in introducing them into the interior of the uterus.

[1] La Vake, R. R.: Amer. Jour. Surgery, November, 1929, p. 683.

CHILD WELFARE IN AUSTRIA.

THE Commonwealth Fund is now actively promoting schemes for child welfare in Europe as well as in America, and the directors of that branch of the Fund which serves Austria have issued a report [1] of their efforts over a period of six years. They have followed the excellent American practice of subscribing generously to any venture which they have helped to set on foot, while not subsidising it entirely. This guards against the collapse of a project when funds are withdrawn, and has the

[1] The Commonwealth Fund Activities in Austria: A Record of Collaboration for Child Health, 1923–29. New York: The Commonwealth Fund Division of Publications. George Grady Press.

added advantage of stimulating local effort. The difficulties of coördinating health organisation in post-war Austria are well described; the independence of the nine provinces, with feudal traditions suddenly overthrown but still in the minds of the people, and the shattered economic situation, make this no easy field for health work. The character of the Austrians, however, lends them stability in their disorganised environment. They are receptive, and readily inclined to take an intelligent interest in fresh views, while the autocratic Government to which they were formerly accustomed has made them amenable to direction and guidance; for example, the patients attend unquestioningly at the clinics on the date fixed by the doctor. But the intensely local patriotism of each province makes any central organisation impracticable at the present time. Medical assistance for the sick child after the war was obtainable in Austria by means of several different agencies. One way was through the health insurance societies, or Krankenkassen, which provided treatment for the families of their members; another was through private child health stations instituted and run by doctors; a third was through the city health stations, or Jugendämter, with which there came to be associated after the war a group of trained workers called the Fürsorgerinnen. The functions of these home workers cannot be exactly matched elsewhere; they combine advice on child welfare to the mothers with a knowledge of standardised procedure in social problems; that is to say, they arrange for State care of illegitimate and orphan children where necessary, and for reception into institutions of tuberculous or mentally defective cases. Their influence among the peasantry is large, and has been of great assistance in solidifying the new health schemes which the Commonwealth Fund has helped to set on foot. For every province the reorganisation of child health work had to be approached in a different manner. The report gives a detailed account of the various methods employed and the results obtained. The aim has been throughout to exert a unifying influence, and the Fund has done much to coördinate the work of the health centres in each province, to promote a friendly spirit between the staffs of the different clinics, and to provide facilities for foreign travel and instructional courses for the workers. This has had an encouraging effect on the general efficiency of the service, and has greatly stimulated the interest of those engaged in it. Gifts of equipment have been made by the Fund, and assistance given in improving old quarters or obtaining new ones. This coöperation has helped considerably to relieve the post-war depression in the Austrian medical service.

INFECTION AS A CAUSE OF DIABETES MELLITUS.

THE ætiology of diabetes mellitus remains a problem of great complexity. The classical experiments of Minkowski and von Mering [1] on the effects of pancreatectomy and the isolation of insulin indicate that the essential defect is an inadequate supply of the pancreatic hormone. Many factors, however, are known to be capable of thus adversely affecting the secretion of insulin, and diabetes must be regarded, not as a morbid entity, but as the end-result of a variety of pathological processes. In a minority of cases the chain of events is relatively simple. In the diabetes which sometimes complicates hyperthyroidism, for example, it is probable that over-activity of the thyroid leads to over-stimulation, followed by exhaustion, of the β cells of the islets of Langerhans. In the great majority of cases of diabetes, however, the damaging agent is not obvious. At a recent meeting of the Pathological Society of Manchester Dr. T. H. Oliver and Dr. G. J. Langley discussed the possibility that diabetes is sometimes infectious in origin. There is much circumstantial evidence in favour of this view. Various bacterial and allied poisons, such as diphtheria toxin (Tisdall, Drake, and Brown [2]), typhoid vaccine, and histamine are known to lower carbohydrate tolerance in animals, and in human diabetes coincident infection very frequently causes a temporary or even a permanent decrease in the response to insulin, and often precipitates coma. Dental sepsis is almost universal in diabetic patients, but, while it is attractive to attribute diabetes to continued absorption of bacterial toxins from the teeth sockets, it must not be forgotten that the dental infection may be the result of that lowered resistance to bacterial invasion which is common to all diabetics. In young subjects diabetes occasionally follows an acute infectious disease such as mumps, and in many cases of acute diabetes the onset of the symptoms can be traced to an indefinite febrile illness. These considerations have led many observers (cf. Frissell and Hajek [3]) to suggest an infectious origin in such cases. Bergey's claim [4] to have isolated from diabetic urine a filter-passing virus capable of producing glycosuria in rabbits does not appear to have been substantiated, but a virus infection, analogous to mumps, may well be concerned. If this is so, since diabetes is not contagious, the virus must be widespread and, like the virus of febrile herpes, must remain latent until activated by some other infection.

Infection undoubtedly plays some part in the production of diabetes; how large a part this is remains uncertain.

[1] Minkowski and von Mering: Arch. f. Exp. Path. u. Pharm., 1889–90, xxvi., 371.

A RELIABLE TEST FOR PREGNANCY.

LAST week, in recording inconclusive though encouraging results of attempts to get clinical improvement by injections of œstrin, we had occasion to regret that the sexual cycle in man has no exact parallel in the animal world. In this issue of THE LANCET Dr. H. Allan and Dr. F. Dickens show that man's peculiarities in this respect can sometimes be exploited to good advantage. If the pregnancy test devised by Zondek and Aschheim had been tried out on domestic animals, such as cows, where early knowledge of impregnation would be of great value to dairy farmers, it might easily have been dismissed as worthless; in the few pregnant animals tested—cows, cats, and rabbits—the results obtained were negative. Fortunately the urine of pregnant women appears to contain a hormone which, when injected into immature mice, produces changes in the ovary that can mostly be recognised macroscopically. This hormone is not œstrin, which is also present in the urine and, as our Berlin correspondent reports, may be obtained from this source in an extraordinary state of purity. Œstrin, however, produces no such change in the ovaries, though it has an effect on the development of the immature uterus and vagina. Zondek and Aschheim believe the active hormone to be anterior pituitary.

From the clinical point of view the important fact is that critical observers such as those working at the Courtauld Institute of Biochemistry of the Middlesex Hospital, under Prof. E. C. Dodds, have found that among 126 women known to be pregnant 122 gave a positive test, while only 1 out of 82 non-pregnant women did so. Moreover, the patients selected were at an early stage of pregnancy when clinical diagnosis is still difficult. The test seems to be sufficiently reliable for all clinical purposes, and has the further advantage that in delicate circumstances it can be done without the knowledge of the patient or her friends. The technique needs practice, but is likely to be acquired by clinical pathologists now that the value of the test has been

[2] Tisdall, F. F., Drake, T. G. H., and Brown, A.: Amer. Jour Dis. Children, 1926, xxxii., 854.

[3] Frissell, L. F., and Hajek, J.: Arch. Int. Med., 1924, xxxiii., 230.

[4] Bergey, D. H.: Proc. Soc. of Exper. Biol. and Med., 1926, xxiv., 229.

confirmed. The family doctor will be grateful for the simplicity of his share, which consists only in collecting morning urine from the patient and possibly adding a drop of tricresol as a preservative.

A SERVICEABLE LIBEL.

A WEEK or two ago our Paris correspondent told how a physician of good repute had exposed a "specific" against tuberculosis composed of cigarette paper soaked and crumbled, and had called the inventor of this priceless remedy a thief and a quack. For this language Dr. Nast was sued for libel, although it was anticipated that, even if he was convicted, the court would let him off lightly. This has proved to be the case, for the sentence passed on Dr. Nast carries the minimal penalty allowed by law—namely, 1 franc of damages to the inventor of the "specific" and a fine of 25 francs, which need only be paid if the malefactor is again convicted within the next five years. It is customary in France for one who is convicted of libel to be ordered to insert an apology in specified newspapers at his own expense, which may be considerable. Dr. Nast has not been required to make any such insertions. The action of the court is regarded as of real significance in medical circles, for, generally speaking, French judges are not specially indulgent to medical men, and have sometimes been regarded as giving them more than their deserts. Dr. Nast, it is clear, is regarded as having done public service in exposing a remedy which had received extravagant prominence in the press to such effect that sanatorium practice was endangered and patients seriously upset by the withholding of a remedy from which they had been led to expect so much. There is still a possibility that the inventor himself may get into trouble for having practised medicine without any qualification.

THE CHAIR OF MEDICINE IN THE UNIVERSITY OF ABERDEEN.

THE Regius Chair of Medicine in the University o Aberdeen is the oldest foundation for the teaching of medicine in Great Britain, and an interesting departure in filling the appointment has occurred, following the resignation of Prof. Ashley Mackintosh. Hitherto the Professorship has been held as a part-time appointment with a salary of £850 a year. Henceforth a salary of £1200 will be attached to the Chair, in view of the Professor being expected to devote more time to teaching and to the initiation and conduct of research. Further, the holder of the Chair becomes honorary physician to the Royal Infirmary of Aberdeen, and, having charge of beds, will be in a position to associate the activities of research with clinical practice. The appointment to the Professorship is made by the Crown on the recommendation of the Secretary of State for Scotland, and there should be, and quickly, strong candidates in the field, for the opportunities of doing valuable work are obvious, especially as additional assistance and full facilities for the conduct of research are to be provided.

MEDICAL STAFF OF THE MINISTRY OF HEALTH.—Following the retirement of Dr. F. J. H. Coutts, from the post of senior medical officer for tuberculosis, venereal disease and general institutional therapy, this appointment will be held by Dr. A. S. MacNalty, while Dr. J. Alison Glover has become deputy senior medical officer. Dr. A. W. J. MacFadden, the senior medical officer with supervision of food supplies, is succeeded by Dr. Thomas Carnwath, this section being enlarged to include therapeutic substances, medical aspects of water supply and the medical administration of the Local Government Act in London. Dr. Miles B. Arnold takes the place of Dr. J. R. Hutchinson as deputy senior medical officer to Dr. H. A. Macewen in the section of sanitary administration, and Dr. Hutchinson has been appointed deputy senior medical officer to Sir George Buchanan in the section of general health and epidemiology.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXCVII.

TREATMENT OF THE TYPHOID FEVERS.

PART I.*

Typhoid fever is a disease peculiar to man. Paratyphoid fever, on the other hand, occurs both in man and in domestic animals—dogs, cats, pigs, rabbits, and parrots (Vincent and Muratet)—and may be transmitted from these animals to man. Three varieties of paratyphoid infection are described—para. A, para. B, para. C; of these para. B is the most frequent in the British Isles.

Differential Diagnosis between the Typhoid Fevers.

Though paratyphoid fever is usually less severe and of shorter duration than typhoid is wont to be, the same complications may occur in both infections, and for this reason precisely the same care and precautions are to be observed in treating the one as the other. In paratyphoid the incubation period may be shorter than the 12 days of typhoid; the onset may be abrupt, even with a rigor; the pyrexia is seldom of the continuous type, often showing a daily variation of 2° or 3°; termination by lysis may take place in the third week. In paratyphoid, symptoms referable to the respiratory system may dominate the clinical picture with or without physical signs of broncho-pneumonia. In paratyphoid, the septicæmic stage, during which diagnosis may be made by blood culture, usually lasts but three or four days, whereas in typhoid a positive blood culture is often obtainable for the first week or ten days; only in very grave cases does a demonstrable septicæmia persist. In paratyphoid, the colon may be the chief seat of ulceration; in typhoid, ulceration of the intestine is often confined to the Peyer's patches of the lower six feet of the ileum. The specific bacillus in paratyphoid B may be demonstrated in the stools more constantly than is the case of *B. typhosus* in typhoid fever—a fact which renders examination of the stool of great value in the diagnosis of paratyphoid. The leucopenia characteristic of typhoid fever after the first few days is inconstant in the paratyphoid infections, and may indeed be replaced by a moderate leucocytosis.

General Management of the Case.

As soon as typhoid fever is suspected the patient is confined strictly to bed; the earlier absolute rest is enforced the greater is the chance of recovery. Intelligent nurses for day and night duty are essential. The ideal room in which to nurse the patient is quiet, large, light and airy, getting the sun yet capable of being darkened, and with adequate lavatory accommodation close at hand. The bed is a single one, mounted on wheel castors, with a firm mattress, and so placed that the nurses can walk round it; not more than two pillows are allowed. A water bed is not necessary but an air ring is to be provided. When feasible, the patient's comfort is enhanced by the provision of two similar beds, one for day and the other for night; when the beds are wheeled side by side, the patient may be lifted from the one to the other with but little disturbance.

Special china and cutlery is set apart for the patient's sole use; and arrangements are made for disinfection of the nurse's hands, of the patient's excreta, and of all objects with which he comes in contact. The specific organism may be discharged in the stool, in vomit, in urine, in sputum, and in any purulent

* Part II. will appear next week.

discharge which may be present; all such materies morbi demand disinfection. The fæces, after inspection, are thoroughly mixed with an equal volume of 1 in 20 carbolic solution, and allowed to stand for one hour before being disposed of; to the urine half its volume of 1 in 20 carbolic is added, and the vessel washed out with this solution after use. Sponges and cloths used for washing the patient are disinfected after use, and all bed linen and clothing soaked in carbolic before being sent to the laundry; the crockery is sterilised by boiling after use. Flies are denied access to the sick quarters.

However ill the patient may be, the whole body is washed at least once a day with soap and water, the pressure points receiving frequent and special attention in order to prevent bed sores, to which end also, and to avoid hypostatic congestion, the patient's position is changed every four hours. The mouth also requires especial care; a thorough cleansing after each feed should be undertaken either by the patient himself or by his nurse. An efficient and pleasant mouth-wash is furnished by adding a teaspoonful of the following mixture to half a tumbler of water:—

℞	Liq. potassæ	ʒ 1
	Ac. carbol.	ʒ 4
	Tr. cocci	q.s.
	Aquam ad	ʒ 6

Any tendency to dryness of the lips may be checked by the application of a simple ointment.

If the temperature rises above 103° F. the patient is cradled; when it exceeds 104° sponging with hot water (110°) is just as efficacious as is tepid sponging for the reduction of pyrexia, and is less likely to cause discomfort.

As a rule the typhoid patient is to be awakened at night when feeds are due; attempts are to be made to check mouth-breathing when it occurs, as thereby dryness of the mouth is aggravated.

The patient is kept in bed for at least two weeks after defervescence is complete; a week is occupied in the process of getting up, careful watch being kept for increase in pulse frequency which, should it occur, is an indication for more rest. In a case of any severity the patient will not be fit to return to work for three months.

Before the patient is discharged the stools and urine should be examined for the specific organism three times at five-day intervals. But even with three negative reports a carrier may be overlooked. The treatment of carriers is unsatisfactory; even when there is evidence of cholecystitis or of cholelithiasis removal of the gall-bladder may not be successful in curing the carrier state since the bile ducts may be infected. In order to prevent spread of the disease a carrier should not be permitted to work in the preparation or handling of food for human use, and prophylactic inoculation of contacts is advisable.

It is a wise precaution to give at once prophylactic vaccine to nurses and other members of the household who have not already suffered from the disease or been inoculated within two years. Three subcutaneous injections of mixed TAB vaccine are given at ten-day intervals; for an adult the first dose is 500 million typhoid and 250 million each of para. B and para. A. The dose is doubled at each succeeding injection.

Feeding.

The patient is not to be propped up in bed for feeding, or any other purpose, until the temperature has been down for at least seven days; fluids are given in a feeding cup or sucked through a tube, other articles administered with a spoon.

Throughout the whole course of typhoid fever the patient is encouraged to take food. Though milk is the mainstay there is no reason why certain solid articles should not be allowed, so long as the patient is able to masticate them thoroughly and has the desire for them; mastication increases the flow of saliva and is an important factor in keeping the mouth clean and in preventing septic parotitis. A liberal diet in the early stages helps to maintain the patient's strength, and so prepare him the better to withstand certain complications which may arise later, the incidence of which is not diminished by relative starvation. An accurate record is to be kept of the quantity and composition of all feeds given; in the choice of food, the patient's own likes and dislikes are carefully considered, but more must not be given than he is able to digest. In addition to the regular feeds at stated times, he is urged to take sufficient water or lemonade in between times to bring the total liquid consumption up to five or six pints in the 24 hours. This promotes diuresis and aids in the elimination of toxins. Should vomiting occur, all food must be withheld for a few hours; diarrhœa often indicates a diet too rich in fat; abdominal distension calls for a reduction in carbohydrate.

W. Coleman considers the typhoid patient's food requirement is from 60–80 calories per kg. of body-weight per diem—i.e., nearly 5000 calories for a man weighing 11 st.; it is important that the daily carbohydrate ration should not fall below 50 g. lest acidosis develop.

During the first week of the disease, if headache is troublesome, the appetite is apt to be poor though thirst is not seldom a complaint. At this stage the daily diet, exclusive of water, consists of 3 pints of milk, 2 eggs, 1½ oz. of cream, and 3 oz. of lactose (calorie value approximately 1550). A feed of, say, 6½ oz. is given two-hourly by day and four-hourly by night, the eggs being beaten up with four of the feeds or made into custard. Milk without egg may be flavoured with tea, coffee, chocolate, or cocoa, and given either warm or iced in the feeding cup.

During the first few days the diet is tentatively increased by the addition of lactose and of cream—say, 1½ oz. of each a day up to a total of 6 or 8 oz., thus raising the calorie value to about 2500. Barley-sugar may be appreciated, especially by children. At the end of the first week, or before if the patient will take it, rusks, breakfast biscuits, or thin bread (without crust) and butter, honey or jelly, junket or blancmange, or 2 oz. of pounded steamed or boiled white fish and a little apple or prune purée with cream may be added gradually to the daily ration. Eggs may be lightly boiled. Feeds are now given three-hourly by day, and the patient is urged to drink water, or lemonade with added lactose, in the intervals. No further addition to the diet is permitted until convalescence is well advanced, though the frequency may be reduced, and the quantity of each feed correspondingly increased when defervescence is established. Certain individuals assert their inability to take plain milk. If this statement proves to be true, the addition of citrate, grs. 2 to the ounce of milk, or the substitution of malted milk or junket and whey may have the desired effect. Failing this the diet is to consist of plasmon and gruel, made from fine oatmeal or Robertson's barley passed through a sieve, thick vegetable soups, carefully strained, mashed baked potato, tapioca or bread pudding with the above-mentioned quantities of cream and lactose.

Following the pyrexial period, if all goes well, the temperature remains subnormal for a week or ten days; should it not do so, and in the absence of other obvious cause, a relapse or recrudescence is likely. The probability of a relapse is greater if the spleen remains palpable, and if Ehrlich's diazo reaction, which usually disappears with the commencement of lysis, again becomes positive in the urine (Rolleston).

Ehrlich's Diazo Reaction.—Requirements. Fresh solutions: 1. Saturated solution of sulphanilic acid in 1 in 20 HCl. 2. 0·5 per cent. aqueous solution of sodium nitrite. 3. Liquor ammon. fort.

Technique.—Fill a test-tube one-third full of urine and add an equal volume of sulphanilic acid solution. Mix by inverting, and add one drop of nitrite solution. Shake to frothing, and add ammonia slowly. A positive reaction is indicated by a pink coloration of the froth, the urine becoming deep crimson.

A relapse is treated in the same fashion as the primary attack.

The Bowels.

The use of the bed pan is insisted upon from the very start of the illness until the temperature has been subnormal for at least seven days.

No aperient is given by the mouth from the end of the first week until at least ten days after defervescence is complete, lest ulceration still be present. Constipation and diarrhoea may usually be controlled by alterations in diet. It is most important that the stools be soft; if the fæces are hard or defæcation difficult, the amount of fat and lactose in the diet is increased, provided nausea and meteorism is not induced thereby. Should the addition of fat not be tolerated, the quantity of milk is reduced and an equal amount of beef-tea or clear chicken soup substituted. A dessertspoonful of liquid paraffin two or three times a day, or a glycerine suppository may help matters, but if the fæces are still hard or difficult to expel, a plain soap-and-water enema is given on alternate days. When diarrhoea—more than three of four actions in the 24 hours—does not respond to a reduction of fat, or to the substitution of malted milk for plain milk, it is necessary to give small doses of Dover's powder which may be combined with kaolin. Tenesmus, in association with diarrhoea, may be checked by a rectal wash-out with a pint of warm normal saline solution followed by a belladonna suppository, or starch and opium (tr. opii ℥xxx.–xlv. in starch emulsion ℥iv.) given cold through a catheter, the tip of which is inserted just beyond the internal sphincter.

Abdominal *distension* usually indicates a diet too rich in carbohydrate, but in profoundly toxic cases it may be paralytic in origin. Distension is a serious condition, and one which the physician must constantly be on the alert to detect when carrying out the daily inspection of the abdomen. At the first sign of distension the carbohydrate intake is reduced and the total fluid cut down to 3½ pints; milk infected with *B. bulgaricus* or *B. acidophilus* is useful in certain cases. When the colon is mainly affected, tr. asafetidæ ℥ii. in mucilage of starch ℥iv. may be injected into the rectum. If the condition persists and is not associated with hæmorrhage, heat is applied to the abdomen, and an emulsion of ℥xx. of turpentine or a capsule containing ℥v. of oil of cinnamon given by mouth two- or four-hourly, and a half pint ox gall enema. Collosol kaolin ℥iii. in water ℥iv., given by the mouth three or four times a day is often useful. Should these measures fail, a hypodermic of eserine sulphate, gr. 1/200 combined with strychnine, gr. 1/60 must be given, and repeated in four hours if necessary; alternately, an intramuscular injection of pituitrin ½ c.cm., may be used.

Urine.

The quantity of *urine* passed is to be recorded. Retention of urine is not infrequent quite early in the disease; when fomentations fail to relieve the condition, which is usually of short duration, catheterisation at stated intervals is necessary. If "incontinence" occurs take care lest the condition be retention overflow; passage of a catheter may be necessary for diagnosis when meteorism is present.

Special watch is to be kept after the second week for the occurrence of bacilluria. In this condition the urine is generally pale in colour and uniformly turbid. The turbidity does not clear on standing, nor is it removed by ordinary filtration; the specimen gives a peculiar satiny shimmer when gently shaken.

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Special Articles.

THE ZONDEK AND ASCHHEIM TEST FOR PREGNANCY.

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Recent work on the sex hormones has provided an entirely new basis for a test for pregnancy. In 1927 Zondek and Aschheim [1] described experiments showing that implantations of male or female pituitary tissue into immature female mice produced precocious sexual maturity. The most noticeable external changes were: (*a*) the canalisation of the vagina and (*b*) the appearance of œstrus, as judged by the vaginal smear. Post-mortem examination of these animals revealed that the uteri were hyperæmic and greatly enlarged; the ovaries were much increased in size, and there were present on them some minute dark spots—termed by Zondek and Aschheim "Blutpunkte." In the following account these are referred to as "corpora hæmorrhagica." Examination of sections of the ovaries from the treated mice showed that a very large proportion of the follicles present in the ovary had become mature; that the corpora hæmorrhagica were, in fact, unruptured follicles into which blood had been extravasated, and, further, that a number of corpora lutea were frequently to be seen, some of which contained a degenerating ovum. The corpora lutea of the latter type, which were evidently formed without previous rupture of the follicles, are the so-called "corpora lutea atretica." Later [2 3] these authors observed that during pregnancy a hormone producing effects closely resembling those brought about by implantation of anterior pituitary tissue appears in the urine; this observation forms the basis of the test for pregnancy now under consideration.

It may be remarked here that Smith and Engle [4] have arrived at slightly different conclusions as to the effects produced by implantation of anterior pituitary substance into immature animals. They find that ripening of the Graafian follicles and ovulation are the principal effects, and that atretic follicles are, in fact, *less* frequently seen than in the normal adult animal; also they do not find corpora hæmorrhagica. Whatever the explanation of this difference may prove to be, it is to be regarded as an important theoretical point which may be considered apart from any estimate of the practical value of the Zondek and Aschheim test. There is no doubt that the effects of injection of urine from pregnant women into immature mice are as described by Zondek and Aschheim, and that these changes can readily be obtained by the injection of small quantities of the untreated urine. The presence in the urine of a substance capable of bringing about the above results is considered by Zondek and Aschheim (loc. cit.) as diagnostic of pregnancy, and the results obtained on a large number of cases are brought forward by Aschheim [5] in support of this conclusion.

In view of the importance of a satisfactory means of diagnosing pregnancy, we decided to investigate the reliability of the test in this laboratory. The methods employed and the results obtained are described below.

Experimental.

Urine.—Specimens from the early morning urine were obtained where possible. When the urine had

to be kept for a few days before testing it was stored in a refrigerator at −5° C. If some time was likely to elapse between the passing of the urine and its arrival at the hospital, a trace of tricresol was placed in the collecting bottle to prevent bacterial action. Very slight decomposition of the urine leads to a high mortality in the test animals.

Animals.—For each specimen five or more mice were used. Owing to the difficulty of raising the large numbers required, the mice were purchased from the breeders.* The age of the mice at the beginning of the test was 21 to 24 days, and it is essential that this latter age should not be exceeded. The average weight was 7·5 g., thus indicating that the animals were satisfactory in this respect.

Injections.—Each mouse received six injections of urine distributed as evenly as could conveniently be arranged over a period of 45 hours. The actual times of injection were :—

1st day	12 noon	6 P.M.
2nd day	9 A.M.	3 P.M.–9 P.M.
3rd day	9 A.M.	

Originally the doses recommended by Zondek and Aschheim were used—namely, 6 doses of 0·4 c.cm. to one mouse, 6 of 0·3 c.cm. to another, and so on down to 6 doses of 0·2 c.cm. As we found that the mice receiving the largest doses sometimes showed less response than those receiving the small ones, we modified the procedure so that each animal receives 6 doses of 0·3 c.cm. It is then unnecessary to mark the individual animals. The only advantage in the varying dose seems to lie in the fact that with toxic specimens of urine the animals receiving the smaller doses sometimes survive, but it is usually preferable to obtain a fresh specimen and repeat the test. Not more than 1 drop of tricresol should be added to each 30 c.cm. of urine. The injections are made subcutaneously. Frank [5] states that in his hands the mice died during the test, before readings could be taken, but this has not been our experience. The mortality tends to be high when the investigator lacks experience, but rapidly diminishes with practice, when with the dose mentioned above only a few specimens of urine cause a serious death-rate.

The mice are killed on the morning of the fifth day and their ovaries and uteri are examined.

Interpretation of Examinations of Ovaries and Uteri.—The ovaries of the untreated mouse are small and contain unripened follicles ; the uteri are thread-like, and the vagina is a solid cord of cells. Following the injection of urine a positive test is indicated by the presence of corpora hæmorrhagica or of corpora lutea in the ovaries. The former appear as red dots of varying size but frequently they are about the size of a pin's head. When present on the surface of the ovary they are easily seen and the appearance is quite characteristic. Occasionally they are very small, or are found in the body of the ovary, when their presence may be confirmed by squeezing the ovary, moistened with a drop of glycerol, under a coverslip and examining microscopically. In addition to the hæmorrhagic follicles, corpora lutea are frequently observed. They are most easily recognised by means of a lens. In a few cases it is found necessary to prepare serial sections of the ovaries, solely as confirmation of the macroscopic findings.

The presence in the ovary of either corpora hæmorrhagica or corpora lutea, or of both, constitutes a positive reaction. The test is reported as positive even if these changes occur in only one of the animals used. In our experience, corpora lutea are usually found to be accompanied by corpora hæmorrhagica, and in only four of a total of 126 positive tests were corpora lutea present without corpora hæmorrhagica. All four were normal pregnancies. Certain changes in the uterus, vagina, and vaginal smear are also usually observed. These are enlargement, thickening, and distension of the uterus, opening of the vagina, and sometimes the appearance of the cornified epithelial cells characteristic of œstrus, in the vaginal smear. These changes in the uterus and vagina, however, are due to the œstrus-producing hormone (œstrin), and are not necessarily indicative of pregnancy. The œstrin is derived either from the urine injected or else its presence is due to the liberation of increased amounts from the ovary of the mouse. Many workers have shown that during pregnancy the urine contains a much increased amount of œstrin (Zondek and Aschheim,[6 2] Veler and Doisy,[7] Allan, Dickens, Dodds, and Howitt[8]). Œstrin, however, has no observable effect on the ovaries, and its presence is indicated solely by its effect on the uterus and vagina. The changes produced in the ovaries upon which the diagnosis is based must, therefore, be due to some other cause, and as has been stated, they are attributed by Zondek and Aschheim to the hormone of the anterior lobe of the pituitary.

* The Mousery, Rayleigh, Essex.

Results.

237 specimens of human urine have been examined by the method described. Since there is no difficulty in the clinical diagnosis of advanced pregnancy we have, as far as possible, obtained urine from early pregnancies. In this we have been fortunate in having the coöperation of Mr. L. Carnac Rivett, who has secured most of these cases from Queen Mary's Hospital, Stratford, where the demand for accommodation leads to very early application to the hospital. Table I. shows the collected results.

TABLE I.

Specimens.	Cases.	Test pos.	Test neg.	Per cent. error.
Females definitely known—				
(*a*) to be pregnant	126	122	4	3·2
(*b*) not to be pregnant	82	1	81	1·2
Males	6	0	6	—

The results given in Table I were mainly from cases of simple pregnancy. In addition the series given in Table II. reproduces the results obtained in a number of other conditions.

TABLE II.

Condition.	Cases.	Test pos.	Test neg.
Non-pregnant.			
Normal female—			
24 hrs. after delivery	1	1*	0
48 ,, ,, ,, ...	1	0	1
Lactating	2	0	2
Menstruating	2	0	2
Young girl, 3 months	1	0	1
,, ,, 10 years	1	0	1
Ovarian tumour, benign	2	0	2
After abortion (4 days)	1	0	1
Menopause	5	1*	4
Various gynæcological conditions ..	5	0	5
Extreme obesity	1	0	1
Menorrhagia	1	0	1
Pituitary tumour	1	0	1
Fibroid of uterus	1	0	1
Total	25	2	23
Pregnant.			
Normal female 1½ hrs. before delivery ..	1	1	0
Pulmonary tubercle and pregnancy ..	1	1	0
Total	2	2	—

* Weak.

Discussion and Results.

From Table I. it is clear that a positive test may be relied upon in almost all cases. Only one specimen from a total of 208 pregnant and non-pregnant women gave an incorrect positive result. This case, a woman aged 46 years at the menopause, clinically presented no unusual features. The test was repeated on two separate specimens of urine. The first specimen gave a very feebly positive result in one of five

mice, which showed on microscopic examination the presence of corpora lutea in both ovaries. The test was repeated when the reaction was negative. A new specimen was then procured, when the result was again positive, a small corpus hæmorrhagicum being present, in addition to a corpus luteum in the ovary of one of the eight mice used for the test; the remaining seven mice were negative. A positive result was not obtained in any of the other five cases at the menopause examined, and negative findings are reported also by Zondek and Aschheim in numerous cases. A possible explanation is furnished by the work of Fluhmann,[9] who has shown that after castration, natural or artificial, increased amounts of anterior pituitary hormone are found in the patient's blood. For some reason this particular woman excreted an amount of the hormone into the urine sufficient to give a weakly positive reaction to the Zondek and Aschheim test.

Unlike the tests depending on the presence of the œstrus-producing hormone in the urine, the Zondek and Aschheim reaction is positive early in pregnancy. For example, in one case in which the onset of the menstrual period was only nine days overdue an intensely positive reaction was obtained; and in general it can be stated the test is certainly no weaker in the early cases than in the later ones.

The possible error is somewhat greater when a negative result is obtained. Of 126 pregnant women examined four showed a negative test. One woman miscarried three weeks after the performance of the test. The remainder proceeded to full term normally. The specimens of urine were not toxic, and the test proceeded normally in all four cases.

With regard to Table II., the rapid disappearance of the hormone from the urine following delivery or abortion is well shown. The persistence of the corpus luteum during lactation suggested that the urine might possibly contain sufficient luteinising hormone to give a positive test; this expectation was not fulfilled. At the onset of menstruation also the test was negative, and the hormone was not present in the urine of young girls, although the growth-promoting function of the anterior lobe is presumably very active at this time. Urine from one case of pituitary tumour in a girl of 17 has been tested. The patient showed typical optic phenomena, and the diagnosis was confirmed by X ray examination. The latter showed the growth to be confined to the posterior region of the pituitary fossa as indicated by erosion of the posterior clinoid processes. The result of the test was negative. The cases at menopause have already been described, and this is the only condition in Table II. where any confusion exists.

The animal experiments summarised in Table III. show that the test is not directly applicable to the rabbit, cat, or cow. In these species the urine was often so toxic that all the mice died, even when the urine was neutralised with acid before use, and occasionally after only one injection. Those tests where the survival was sufficiently high to permit any conclusion were uniformly negative. The results with the cow are disappointing in view of the practical importance of the diagnosis of pregnancy in this animal. We are greatly indebted to Dr. R. F. Montgomerie, veterinary adviser to the University College of North Wales, Bangor, for the trouble which he has taken in supplying us with these specimens.

TABLE III.—*Experiments with the Urine of Animals.*

Animal.		Animals.	Specimens.	Result of tests.
Rabbit pregnant		1	1	Neg.
		2	2	Both toxic.
„ ovariectomised ..		2	2	Both neg.
Cats pregnant		1	1	Neg.
		2	2	Both toxic.
Cows (believed pregnant) ..		7	8	All toxic.
		2*	2	Both neg.
Cows' urine diluted before test.	× 5	2	2	„
	× 10	2	2	„

* One served 7 weeks previously: now definitely pregnant.

Conclusions.

Taken together, the results show that in the human subject the test may be relied upon with some confidence, the percentage of error being low for such a reaction.† Exceptions described are: (*a*) one case at the menopause giving a positive reaction; (*b*) four normal pregnancies giving a negative test without apparent cause. With this one exception all tests in which a positive result was obtained were correct. Clinical tests are now being discontinued, since the animals are required in connexion with work now in progress on the chemistry of the substances involved.

We wish to express thanks to those who have kindly placed material at our disposal, particularly to Mr. L. Carnac Rivett, Mr. F. W. Roques, and Mr. A. L. Walker, and also to Prof. E. C. Dodds, for the interest which he has shown in this investigation.

References.

1. Zondek, B., and Aschheim, S.: Klin. Woch., 1927, vi., 248.
2. „ „ „ Ibid., 1928, vii., 831; Zondek, B.: Ibid., 1928, vii., 1401.
3. Aschheim, S.: Klin. Woch., 1928, vii., 1453; Zeitschr. für ärtliche Fortbildung, 1929, xxvi., 5.
4. Smith, P. E., and Engle, E. T.: Amer. Jour. Anat., 1927, xl., 159.
5. Frank, R. T.: The Female Sex Hormone, Illinois, 1929, p. 196.
6. Zondek, B.: Klin. Woch., 1928, vii., 485.
7. Veler, C. D., and Doisy, E. A.: Proc. Soc. Exp. Biol. and Med., 1928, xxv., 806.
8. Allan, H., Dickens, F., Dodds, E. C., and Howitt, F. O.: Biochem. Jour., 1928, xxii., 1526.
9. Fluhmann, C. F.: Jour. Amer. Med. Assoc., 1929, xciii., 672.
10. Wagner, G. A.: Deut. Med. Woch., Dec. 20th, 1929, 2125.

MEDICINE AND THE LAW.

Dr. Knowles's Successful Appeal.

IT is understood that the Judicial Committee of the Privy Council will not announce till February next the reasons for the decision announced on Nov. 19th, to advise His Majesty to allow the appeal of Dr. Benjamin Knowles from the judgment by which he was found guilty at Kumasi of the murder of his wife.

Dr. Starkie's Sentence Reduced.

Dr. Richard William Starkie, sentenced to 12 months' imprisonment in the second division at Maidenhead, on Dec. 2nd, for offences against the Dangerous Drugs Act, appealed to the county quarter sessions at Reading on Dec. 20th, on the ground that the sentence was excessive. Counsel prosecuting for the Crown recalled the facts. The appellant, an unregistered practitioner, had admitted his signature on 16 prescriptions for heroin presented during three months on behalf of a patient named Mrs. Melville. He had told a police inspector that on different occasions he had given blank sheets of paper containing his signature to a man named Melville or Vilmer. The appellant's counsel obtained the answer that there was no suggestion against Dr. Starkie of carrying on a traffic in drugs. He said that two registered practitioners had been persuaded by Vilmer to act as Dr. Starkie had done, and they had been convicted for not keeping proper records. Counsel also objected sharply to the statement of the prosecution in the court below that he had instructions from the Home Office to say that the case was regarded as a serious one. He protested that this was improper, and that the officials of a Government department had no right to form and publish their conclusion about a case without having heard a single word about it in

† Whilst the present paper was in the press, a review appeared by Prof. G. A. Wagner [10] of some recent German work upon this test. In the main, his conclusions are in agreement with our own.

court. The chairman of quarter sessions agreed. In giving final judgment on the appeal he said that the offences were flagrant, and serious breaches of the Dangerous Drugs Regulations which could not be punished in any other way than by imprisonment. The court, however, thought the period of 12 months excessive, and reduced it from 12 to 5 months in the second division.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Deficiency of Beds in Municipal Hospitals.

IT was stated at the Berlin Society for Public Health that during the epidemic of influenza last spring nearly 3000 patients who needed hospital treatment could not be received in the municipal hospitals owing to lack of available beds. About 15 per cent. of the patients in municipal hospitals are incurable or suffer from chronic diseases which do not require the lavish outfit and expensive management of a great general hospital. It was suggested, therefore, that for those patients the city should set up sanatoriums without operating theatres or laboratories, where a relatively small number of nurses would be able to do the work. The establishment of special hospitals for cancer and tuberculosis would free the general hospitals from patients with these diseases. It would be a further relief to the hospitals if indigent patients and those with chronic diseases could be dismissed after the acute stage of their illness and nursed at home on the expense of the municipal authorities. In one of the Berlin districts the local authorities have already appointed municipal nurses, the result being that about 600 patients who otherwise would have been taken to hospital were attended at home. The appointment of 60 municipal nurses would save the provision of 200 beds and in this way a considerable amount of money would be spared for other purposes.

A Sexual Hormone in Crystalline Form.

It is reported in the *Naturwissenschaft* that Dr. Butenandt, of Göttingen, an assistant of Prof. Windaus, has succeeded in isolating the ovarian hormone in a crystalline state. This hormone was shown by Prof. Zondek and Dr. Aschheim and others to be present in the urine during pregnancy in large amounts, a fact which has several times been referred to in your columns.[1] The activity of the hormone is assayed by injecting into castrated mice. Butenandt worked with an oily material which was obtained from the urine of pregnant women, and contained about 30,000 mouse-units per gramme. By repeated distribution between two solvents (aqueous alcohol and petroleum ether) inactive substances were removed in the petroleum ether fraction, and the material then had 500,000 mouse-units per gramme. This substance was further purified by the use of other solvents (ether, benzene, and ethyl acetate) and by adding alkali in increasing strength to the acid solution. An alkali-soluble fraction was obtained which had a mouse-unit of only 1·5 to 2 millionths of a gramme. Further purification was effected by distilling this oil in a vacuum of 0·20–0·03 mm. Hg and at a temperature of 130–150° C., and the material then contained 5,000,000 units per gramme. Sublimation in a high vacuum or treatment with solvents yields a crystalline product of which one gramme contains 8,000,000 mouse-units. The author has named this substance progynon; it is soluble in acetone, chloroform, benzene, and ethyl acetate. Further chemical examination has shown that the substance is not albuminous but belongs to the sterol group. The new work appears to be highly important in adding to our knowledge of the nature of hormones.

[1] See THE LANCET, 1928, ii., 834, 876; 1929, ii., 1108. The possible clinical applications are reviewed on pages 36 and 39 of this issue.

Gauze Visible to X Rays.

It happens sometimes that pieces of gauze are left in the abdominal cavity after laparotomy, and though this usually causes no reaction there are occasionally complications. Gauze swabs may eventually be discharged through the intestines or the bladder, but often they have to be removed at a second laparotomy, when the mortality is somewhat high. Difficulty in diagnosis arises because the ordinary gauze swab cannot be detected by radiography, and Dr. Cahn has therefore devised a special gauze which is not impermeable to X rays. The feature of this gauze is that some of the threads are impregnated by thorium hydroxide which gives a distinct shadow on the Rontgen plate. A surgeon suspecting that a piece of gauze is still in the abdomen can thus settle the question by radiography before closing the abdominal wound. Experiments with the gauze have shown that it is harmless, being neither poisonous nor irritant; Cahn even suggests that the radio-activity of thorium may have a bactericidal action. The gauze is a little stiffer than ordinary gauze but may nevertheless be folded as usual.

Preventoriums.

Prof. Lazarus has drawn attention to the fact that while the mortality from infectious diseases, including tuberculosis, has fallen of late years, the death-rate from senile and pre-senile diseases has considerably increased. In 1927 more people died from diseases of the heart and vessels than from all the infectious diseases put together, and twice as many as from tuberculosis. Prophylaxis against these diseases is possible only if people who are still in apparently good health are thoroughly examined at least twice a year. The family doctor is not in a position to discover early disease—though he may know the patient's constitution—because he does not own the modern apparatus required for the diagnosis of initial symptoms. Public hospitals and university clinics deal only with patients who are already ill. Prof. Lazarus therefore proposes the establishment of special diagnostic centres with every modern facility for diagnosis. These establishments, which he calls "preventoriums," should have no connexion with sick clubs or other State institutions, and should be set up by the medical profession itself, the specialists being appointed by representatives of the profession. He believes that examination of the whole population twice a year would do much to prevent senile diseases and his idea is certainly a good one, though probably too expensive for execution.

Damage from Irradiated Ergosterol.

An infant whose birth was retarded two weeks and whose initial weight was 4500 g. became weak soon after being born. He had vomiting, a certain rigidity of the skin, and a subfebrile evening temperature; the Pirquet reaction was negative. Though no symptoms of rickets were present, 6 drops of irradiated ergosterol (vigantol) were administered daily, beginning in the tenth week, and this dose was continued for 96 days. Seventy days after the beginning of the treatment leucocytes and albumin were found in the urine but were ascribed to cystitis. The child died when 5½ months old and the post-mortem examination, as reported by Dr. Puschler, in the *Zeitschrift für Kinderheilkunde*, showed severe calcification of the tubules and interstitial tissue of the kidneys. The administration of irradiated ergosterol seems to have caused this condition, which corresponds with what is found in animals fed in the same way. The case suggests that this substance is by no means harmless if given to infants not suffering from rickets.

Since the war a considerable increase has been observed in the incidence of thrombosis and embolism after delivery and abdominal operations. The cause of the increase is not yet fully clear, but Prof. Sellheim, of Leipzig, the well-known gynæcologist, is of opinion that it is due to cardiac weakness. During and after

the war, he says, the hearts of many women were so much injured by exertion, hunger, and grief that they are unable to stand the strain of delivery or abdominal operation. Not only those who were already adult during the war but also those of the younger generation which was then developing are especially liable to thrombosis in consequence.

Dr. Louis Lewin, late professor of pharmacology in the University of Berlin, has died at the age of 80. His special branch was the study of poisons and his standard work on toxicology ran into several editions, and was translated into French. The doyen of German pharmacologists, he was busy until recently, and only last year wrote an essay on banisterin which aroused general interest. Apart from his scientific work he often acted as expert of the law courts in difficult criminal cases connected with poisoning.

Dr. Kino, writing in the *Medizinische Welt*, draws attention to paresis of the ulnar nerve in cyclists and motor-drivers. The paresis may be produced by pressure of the hand on the steering wheel or the handle-bar. The condition becomes manifest by weakness and tickling in the fourth and fifth fingers; in severe cases a typical motor and sensory paresis of the fourth and fifth fingers and sometimes muscular atrophy, may develop. The prognosis is favourable provided the patient abstains from work for several months. It is possible that the paresis is not only produced by a direct pressure of the nerve but also by the perpetual shaking in driving.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

A Conference on Public Health.

THE Minister for Local Government and Public Health has taken an important step in issuing invitations to the local health authorities to hold a Conference in Dublin for various discussions. He points out that in recent years much has been done to improve the organisation of public hygiene and the services for the care of the sick and the poor, and it is felt that a stage has now been reached when an exchange of opinion and experience and a discussion of difficulties would be of value in supplementing ordinary official methods, and in promoting a closer understanding between the agencies concerned in these services. He suggests several topics suitable for discussion—namely, the despatch of business at meetings of boards of health and public assistance; the county medical officer of health and his functions; the economy of preventive measures in health administration; health of the school child; improvement of county homes; rural health problems; welfare of children in the care of public assistance authority; health education and methods by which it can be promoted; and administration of home assistance. He invites local authorities to suggest other subjects for discussion, but thinks it desirable that the attention of the Conference should be directed to matters of practical importance and to improvements within existing resources, rather than to ideal solutions of problems. It is further suggested that, together with two delegates from within their own body, each local authority should send its secretary and its medical officer to attend the Conference. Such a Conference as the Minister has summoned can hardly fail to have a high educative value. The local authorities lag behind the central authority both in interest in and in knowledge of health problems, and it is necessary that their interest should be aroused and their knowledge increased if proper progress is to be made. In the counties in which county medical officers of health have been appointed there is already evidence of an increased interest in health.

Appointment of Medical Superintendents of Mental Hospitals.

Differences have arisen between the committees of management of two mental hospitals in the Irish Free State and the Minister of Local Government and Public Health as to the mode of appointment to the vacant posts of medical superintendents. In each case—Clonmel and Sligo—the committees wished to promote the assistant medical officer, who had given several years of good service in the subordinate post. The committees relied on the right apparently reserved to them in the Local Government (Employees) Act of 1926, to make an appointment by promotion of an officer already in the service without referring the matter to the Appointments' Commissioners. To act in this way, however, the local authority has first to obtain the approval of the Minister, and in each of the present cases the Minister has withheld his approval, and ordered the vacancy to be referred to the Appointments' Commissioners. A deputation from the Clonmel committee interviewed the Minister last week, and put forward strong reasons in favour of allowing the committee to appoint the medical officer who was known to it and was familiar with the working of the hospital. In reply the Minister stressed the importance of the office of resident medical superintendent of a mental hospital, as on his efficiency depended largely the welfare of the patients, the discipline of the staff, and the economic administration of the hospital. It was essential that nothing should be omitted that would ensure the appointment of the best candidate available. Experience and local knowledge should count, but there were other factors of importance which should be considered. The Poor Law Commission had recommended that these appointments should be filled on the advice of the Appointments' Commissioners, and he was now being asked to ignore that recommendation. He added that it was clearly in the interests of the whole medical service of the mental hospitals that there should be a selection free from all local influences. While he sympathised with the wish of the committees to promote its own officer, he regarded it as essential that the whole medical service should know beyond doubt that the department stood for the free flow of promotion, and that appointments would only be made after impartial selection. Some discussion also took place on the question of salary and emoluments, and the Minister expressed the opinion that it was not wise, as a matter of policy, to reduce the emoluments to a point at which these posts would cease to be attractive. They must offer an inducement to young men of talent to enter the service.

Presentation to Dr. Campbell Hall.

Dr. J. Campbell Hall, who had been medical officer of the Monaghan County Hospital for some 40 years, has recently retired from that office. His retirement furnished the occasion for a remarkable exhibition of the affection and esteem in which he is held by the people of County Monaghan. He was presented with an album containing the names of 654 subscribers, together with a purse of gold, and a massive silver centre-piece. A tablet has been placed in the hospital to commemorate his services. The presentation was recently made at a public meeting by the Bishop of Clogher.

HOSPITAL CHANGES IN BIRMINGHAM.—Various changes are being contemplated in relation to the hospitals and homes under the jurisdiction of the Birmingham Public Health Committee and the Asylums Committee. Lodge-road Hospital, which is now used for babies suffering from wasting diseases, is to be taken over by the Asylums Committee for mental cases, and the babies are to be transferred to Canwell Hall, near Sutton Coldfield. The treatment of infectious diseases is to be concentrated at Little Bromwich Hospital, which is to be enlarged at a cost of £70,000. Male mental convalescents are to go to Uffculme Park, King's Heath.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Birth Control.

A NATIONAL campaign by birth control advocates was launched recently with a conference at Columbus, Ohio. The campaign has for its object the repeal of Federal legislation which now prohibits the use of the mails for any matter giving information on contraception or for the transport of contraceptive materials. The plan is to organise the country in four divisions carrying birth control propaganda into every State. The moving spirit of the conference was Mrs. Margaret Sangar who advocated control of conception under the following conditions: (1) to prevent the transmission of diseases to the new-born; (2) to prevent the birth of mentally deficient children; (3) to prevent illness, disability, and death among women who are physically unfit to bear children; (4) to prevent childbirth in adolescence; (5) to enable couples to regulate the size of their families in accordance with their economic means; and (6) to prevent births during the first two years of married life. The last recommendation is supposed to make it easier for married couples to make the psychological adjustments necessary in marriage. It must not be supposed that it would receive the approval of all supporters of the movement. Indeed, in the conference itself there were obvious disagreements about the purposes and consequences of birth control. One speaker regarded it as a cure for overcrowding and a prevention against war. Mrs. Sangar herself now takes the view, so strongly supported by Pearl's studies of population growth, that birth control does not mean limitation but selection of the population.

Fatal Automobile Accidents.

Early estimates of the total of deaths from automobile accidents during 1929 by the American Automobile Association reach the appalling figure of 27,000 deaths. This is greatly in excess of last year's mortality from the same cause. For the 52-week period ending Nov. 2nd the city death-rate is 25·6 per 100,000, compared with a rate of 22·1 per 100,000 a year ago. Camden, N.J., leads with a rate of 74 and Kansas City is at the bottom of the list with a rate of 10. The main cause of the increasing death-rate is probably the increasing congestion of traffic. The Automobile Association estimates that 2¼ million cars will be added to the traffic during this year and make a total of approximately 27 million cars on the roads.

Overcrowded Prisons.

The extent of overcrowding in Federal and State prisons is emphasised in a recent statement by Paul W. Garrett, the editor of the "Handbook of American Prisons." He asserts that 124,783 prisoners are housed in buildings designed to hold only half that number. This "aggravates every problem of sanitation and puts an intolerable strain on the physical and mental health of every man so confined." The mistake made by many States as well as by the Federal Government is that they have passed new laws without making provision for the resulting increase in offenders. Perhaps the most serious result is the lack of means to offer employment to the luckless prisoners. The demoralising effect of this enforced idleness is obvious enough. That prison life may, on the other hand, afford excellent opportunities for reformatory medical work is shown in a report of Dr. Charles C. Sweet, the chief medical officer of Sing Sing Prison. This prison is fortunate in possessing a new hospital, a five-storey fireproof structure providing beds for 125 patients. A block of 88 cells attached to the hospital provides accommodation for chronic invalids. Sing Sing is a receiving prison whose inmates are soon transferred to other institutions. The medical staff do their best to send on the prisoners in better physical condition than when they arrive. More than 7000 injections of arsaphenamine have been given during the last fiscal year (positive Wassermann reactions are found in 12 per cent. of white prisoners and in 42 per cent. of the negro prisoners). Other needs are disclosed at the routine physical examination given to all prisoners on admission and the men are invited to submit to corrective treatment or sign a statement of refusal. In the past three years more than 90 per cent. have accepted the former alternative.

Cost of Medical Care.

Two years after its inception the Committee on the Cost of Medical Care has issued an interim report. At first glance it is rather a disappointing document. "The Committee . . . hopes that is may be possible to work out plans for the provision of adequate and efficient therapeutic and preventive treatment for all the people. . . . What plans will be developed the Committee does not know. After a year and a half of study, however, it believes that its investigation will define the difficulties of the present situation and will result in helpful recommendations." A somewhat undersized infant, one might say, after nearly two years of labour. Meanwhile, the State of New York is inaugurating a practical experiment which it is hoped may solve the problem locally, when the new public welfare law goes into effect at the beginning of the New Year. Whereas the old poor-law states that officials *may* give care in a hospital to an indigent sick person, the new public welfare law states that the official *shall* give any type of medical care needed, not only to completely destitute persons but also to "persons otherwise able to maintain themselves who cannot secure necessary medical care." The old law mentions care in a hospital, the new law care in the home, in a dispensary, hospital, or elsewhere. Illness need no longer be acute to arouse the interest and aid of the State. Prevention through early treatment of remediable defects is clearly envisaged. In this way the State may actually save expense as well as the lives of its citizens. To Englishmen it will perhaps not appear so very surprising that a State should recognise the maintenance of health as a proper public function, but in this country, where anything that savours in the least of "State medicine" is regarded with emotional horror by the great majority of physicians, the new law takes on an almost revolutionary significance.

A Medical Information Bureau.

It is now just over a year since the Medical Society of the County of New York and the New York Academy of Medicine jointly founded a medical information bureau. During the first year of its activity the bureau has sent out over a thousand letters and answered as many inquiries by telephones as by the post. The inquiries have come from all parts of the world and have been of the most diverse character. One inquirer had heard on the authority of "a doctor in England" that many women have their middle toes removed so that they may wear fashionable shoes and wanted to know whether the report was true or not. The bureau has been used by a number of organisations both commercial and philanthropic, including the Better Business Bureau and the newspapers. It is of interest to note that several of the larger advertising concerns have used the bureau as consultant in censorship. The bureau has also been active in "releasing" to the press statements concerning quackery and articles of popular health instruction. The bureau looks forward to increased activity and rapid growth in the coming year.

Public Health Services.

THE MINISTRY'S INSTRUCTIONS TO M.O.H.'S.

CIRCULAR 1048 of the Ministry of Health, issued on Dec. 5th of last year, indicates that the instructions to medical officers of health on drawing up their reports for 1929 are the same as for the previous year, except that reference to action under the statutory provisions repealed by the Nursing Homes Registration Act, 1927, is to be disregarded. The circular gives notice that in future the Registrar-General will furnish to all medical officers of health particulars of stillbirths by sex and legitimacy, and the medical officer is asked to include these particulars in his report. In the 1928 reports no general rule was observed. In some cases the registered stillbirths were given, in some cases the notified only, and in other cases there was no reference to stillbirths at all. In the past it has been our usual practice to discontinue comments on the annual reports after the close of the year of issue. The 1928 reports were, however, issued somewhat later in the year than usual owing, we understand, to pressure in the Registrar-General's office, which delayed the sending out of the usual statistical information to medical officers of health. We propose therefore to continue our comments on the 1928 reports for some issues in the new year.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

TEN METROPOLITAN BOROUGHS.

THE following are some 1928 statistics of ten metropolitan boroughs:—

Name of borough and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Chelsea .. .. (63,630)	12·6	13·5	1·19	2·00	1·6	3·1	49/16	27	3·7
Hackney .. (217,200)	16·0	11·7	0·85	1·56	1·8	2·1	67/27	27	4·3
Hampstead .. (85,880)	11·6	11·6	0·53	1·95	1·7	2·1	54/19	13	6·0
Islington .. (324,700)	17·8	12·8	1·12	1·63	2·2	2·2	64/24	50	4·3
Poplar .. .. (162,000)	19·9	11·8	1·10	1·26	2·1	1·8	71/23	44	2·5
Southwark .. (181,300)	19·2	12·7	1·27	1·39	2·1	2·4	70/24	44	3·2
St. Marylebone (104,000)	12·7	11·9	0·88	1·45	1·6	2·2	80/26	41	6·8
St. Pancras .. (205,606)	15·9	12·8	1·08	1·59	1·9	2·2	80/25	50	2·1
Wandsworth .. (347,300)	13·6	10·9	0·85	1·45	1·4	2·0	50/23	23	4·5
Woolwich .. (141,109)	15·5	11·0	1·17	1·48	1·5	1·8	50/22	22	5·7

Relation of stillbirths to live births: Chelsea, 1·9 per cent.; Hackney, 3·7 per cent.; Hampstead, 3·6 per cent.; Islington, 2·5 per cent.; Poplar, 3·1 per cent.; Wandsworth, 2·0 per cent.; and Woolwich, 3·5 per cent.

Chelsea.

Dr. W. H. L. McCarthy's report shows that full use is made of the many voluntary agencies in the borough. Thus the Chelsea Health Society and School for Mothers, which employs four "part-time" medical women and a staff of health visitors, conducts the clinics and treatment centres in return for a subsidy of £750. Lady Melchett is the chairman of the committee, and she and Lord Melchett have purchased a large site adjoining the society's present premises with a view to erecting thereon a new maternity and child welfare centre. The tuberculosis dispensary is located at the Brompton Hospital, and the tuberculosis officer, Dr. W. J. Fenton, is one of the honorary physicians to the hospital. The borough council makes an annual grant of £1000 to the hospital and an additional payment of £160 for home visitation by the nurses. The borough council also subsidises the Nursing Association, the Day Nursing, and the Invalid Children's Aid Association, and has representation on the committees of these voluntary societies. Payments are made to the Ormond Maternity Home (six beds), the only institution of this kind in the borough, for the admission of necessitous maternity cases, and also to private midwives for domiciliary attendance, the net cost to the council for these services being £28 10*s.* 6*d.* for 1928.

Complaints of a serious nuisance from the emission of smoke and grit by the generating station of the London electric railways in Lot's-road gave rise to a conference and the promise of the installation of new boiler plant and suitable grit-arresters. Owing to the overflowing of the Thames on the night of Jan. 6th–7th, 33 basements and ground floors of inhabited premises were flooded, resulting in much hardship and distress, and the ruin of a large amount of furniture and household equipment. Energetic relief measures were adopted and no outbreak of disease was traced to the flood. An interesting survey of housing is given. A great part of Chelsea is comprised in the Cadogan and Sloane Stanley estates, and with the expiry of the leases the old type of small house has largely disappeared, and during the last 30 years some 18,000 Chelsea residents of the working and small trader class have had to migrate. Up to the war various trusts had however provided accommodation for 7000 persons of this type. Since the war the position has been more difficult for tenants of small means. The borough council has provided a block of 56 flats at a weekly rental, including hot water and electricity, of from 25*s.* to £1 14*s.* 3*d.* Two other schemes are in hand for the erection of working-class dwellings by the Guinness and Peabody Trusts respectively. Overcrowding exists mainly in the western district and has been little improved during the year. An effort is made to move overcrowded families to the housing estates of the County Council, 39 such families having been moved during the year, but in many cases the tenants object to being removed so far from their work. An improvement scheme known as "World's End Passage" in the western district has been approved and will result in the erection of 62 flats for 379 persons on the cleared site. There are a large number of houses let in lodgings with insufficient accommodation and conveniences for the several occupying families. Other problems are the dirty and destructive tenant and houses occupied by old people unable to look after themselves. It is hoped to deal with the latter under the L.C.C. Act, 1928, by removal to suitable institutions.

Hackney.

Dr. G. H. Dart mentions that a diphtheria immunisation clinic, conducted by Dr. F. J. Porter-Smith, has been opened. The work has proceeded smoothly, but it is thought that the education authority might give more assistance in making the clinic known. The certificates of immunity granted numbered 292 and 133 children were under treatment at the end of the year. Good results are claimed for the light treatment clinic by Dr. Dorothy Gere. The 111 cases treated included 39 of malnutrition, 11 of failure to gain weight without apparent cause, 21 of rickets, 9 of marasmus, and 8 of debility after acute illness. Dr. Dart considers that the restrictions put by the Ministry on the supply of nursing assistance and milk to mothers are unreasonable. He also describes the difficulty experienced in getting adequate repairs to dilapidated property carried out. The borough council have in hand the erection of 132 flats and 92 maisonettes.

Hampstead.

In 1925 it was estimated that some 2000 Hampstead families were living in an overcrowded condition. During 1928, as the result of the borough council's action, 110 families were moved to the L.C.C. estates at Wormholt and Watling, making with previous removals a total of 142. The inclusive weekly rents of the houses on the Wormholt estate varied from 14*s.* for a three-roomed flat to 21*s.* 6*d.* for a five-roomed cottage. The Watling rentals are somewhat higher. When a house has been vacated by such a removal, there is no power to prevent its being immediately overcrowded again, but only power to deal with the new overcrowding after it occurs. The borough council has, however, been most successful in preventing recurrence of overcrowding by getting into touch with the person responsible for the reletting of the vacated house. Nearly half of the total births (1001) occurred in hospitals or nursing homes. An analysis was made of the available housing accommodation in 340 of the 538 births which occurred at home. Of these 340 births—11·5 per cent. occurred in one-roomed tenements, 34·4 per cent. in two-roomed, and 40·9 per cent. in three-roomed. In three of the one-roomed tenements there were 5 occupants and in one 6 occupants before the birth. In one of the two-roomed tenements there were 8 occupants, in two 9 occupants, and in one 10 occupants prior to the birth of the baby. For the purpose of this investigation kitchens were counted as rooms, but not sculleries, bathrooms, &c. The borough council subscribes £1 for every Hampstead mother confined in Queen Charlotte's Hospital. The municipal prematernity clinic is conducted by a "part-time" lady doctor and was attended by 320 new cases.

Dr. Frank E. Scrase reports that the by-law made by the council as to the fouling of public footways by dogs on the lead came into force in September, 1927, and was well advertised, and that the council decided to take action against offenders reported during 1928. Convictions were obtained in four cases.

Islington.

Dr. G. Clark Trotter gives an instance where the notification of births proved a check on the accuracy of registration. A birth was registered and on investigation as to why it had not been notified, it was found that a woman had adopted a child and re-registered its birth as a child of her own and her husband, an absent seaman. The Registrar-General took proceedings and the woman was fined 10*s.* The maternity and child welfare work is conducted at four voluntary centres with a coördinating committee. The work includes antenatal, light, and dental clinics. One centre has a postnatal clinic where the mothers are examined six weeks after confinement. The balcony of the "west" centre was fitted with vita-glass during the year. An outbreak of small-pox in an Islington institution involved a large amount of work but did not affect the borough itself. In the investigation of puerperal fever the Metropolitan Asylums Board have provided facilities for the examination of swabs from persons attending the confinement. In one fatal case of puerperal sepsis a swab from the eye of the handywoman in attendance showed *Streptococcus viridans* and in another a swab from the septic finger of a handywoman showed hæmolytic streptococci and staphylococci. A summary from the "Dawes" report is given showing that Islington sends great quantities of refuse to dumps in Hertfordshire, and that the management of the tipping is much better conducted than formerly. A circular was sent to all dairymen in the borough asking them to prevent roundsmen from depositing broken glass in the roadway. Owing to complaints as to indifferent milk sold at the Dairy Show at the Agricultural Hall, the inspector went to a stall over which were two notices "Pure New Milk 2*d.* per glass" and "Milk with cream added 6*d.* per glass." A 2*d.* glass of milk was purchased and found to be deficient in fat 54 per cent.

The 37 cases of overcrowding dealt with during the year only represented a proportion of those encountered owing to the difficulty of finding other accommodation. Application was made to the L.C.C. for housing accommodation for 174 "special hardship" cases. During 1928 52 houses were demolished under a L.C.C. improvement scheme and 24 were converted into business premises. Successful prosecutions under the Sale of Food and Drugs Act included a considerable number for liniment of turpentine not in accordance with the B.P. standard and for prescriptions inaccurately dispensed.

Poplar.

Dr. W. Allan Young reports that the overflowing of the Thames affected 1141 houses and involved a large amount of work in the cleansing and disinfection of premises. The flood waters left behind a more or less offensive sludge. Floor boards had to be lifted, water pumped out from underneath, coal had to be supplied for drying, and lime and disinfectants were freely used. In July the flooding of 18 houses in North Bow by the blocking of a main sewer occurred and similar operations had to be carried out. In June a diphtheria immunisation clinic was opened at the new maternity and child welfare centre in Wellington-road, under the charge of Dr. F. J. Porter-Smith. At the close of the year 29 children had been immunised and at the time of writing the report the numbers attending for treatment had considerably increased. In reply to an inquiry from the metropolitan boroughs' standing joint committee on schemes for dealing with acute rheumatism in children, the Poplar Council considered that if a rheumatism supervisory centre could be established at one of the large general hospitals, with sufficient beds for several neighbouring boroughs and a convalescent hospital with education facilities could be established by the L.C.C. or M.A.B., coöperation between Poplar and adjoining boroughs in a scheme might be possible.

Child welfare work is divided between the borough council and the Royal College of St. Katharine. Dr. H. St. H. Vertue, the consulting physician of the municipal observation wards, shows that satisfactory and permanent results were obtained in most of the ill-thriving babies admitted. A children's consultation centre has been established at the London Hospital and during the year 16 cases from Poplar centres were referred to it. Antenatal work is steadily increasing and the popularity of the artificial light clinics with the mothers is shown by an increase in the attendances of 3678 over the 1927 figure to 10,128. For the first time on record there was no death from puerperal sepsis in Poplar. Dr. Harold Waller, the senior medical officer of the Royal College of St. Katharine, in his report deals with the campaign against the overclothing of children. He, of course, admits that artificial light treatment has its place and has served a useful rôle educationally, but he goes on to show with illustrations how much good can be achieved by natural sunlight and fresh air in a garden such as they have at the back of the College.

Southwark.

Dr. H. Wilson reports, as outstanding features of the past year, an outbreak of small-pox, which had not appeared in the borough for 20 years, and the holding of a most successful health week and exhibition. There were 19 cases of small-pox, mostly of the mild type, with one death. The housing problem is still acute and overcrowding can only be overcome by deportation. Many residents, however, object to being removed from a central position to a distance from their work and, if they do move, not infrequently return. During the year 133 families were moved to the L.C.C. estates. One slum area has been cleared and the preliminary steps with regard to a second are in progress. Sutherland House has been

purchased for the maternity and child welfare scheme, and the work of two centres has been transferred there. Much antenatal work is done at Guy's Hospital and it is proposed to have special antenatal sessions at some of the municipal centres. The tuberculosis officer, Dr. J. T. Crowe, refers with satisfaction to the work done by the open-air schools for tnberculous children at Bermondsey and Clapham Common, and to the value of the L.C.C. scheme for the boarding out of the children of infectious tuberculous cases. He thinks the results of light treatment at Guy's Hospital, perhaps owing to poor food and indifferent homes, have not come up to expectations. This form of treatment will probably be discontinued but Finsen light treatment for lupus will go on. An important part of the health department work consists in the examination of food arriving at the wharves, and the certifying of food products exported to foreign countries. Considerable damage and inconvenience was inflicted by flooding at the north end of the borough and every assistance was given in the cleansing of premises and the drying of damaged belongings.

St. Marylebone.

Dr. Charles Porter mentions, as two noteworthy occurrences a small outbreak of small-pox (30 cases with no deaths) which was limited to St. Marylebone Home and Hospital, and the advancement of the Carlisle-street improvement scheme to a further stage. The area to be dealt with is the largest ever represented in the metropolis, covers 7 acres, and affects 340 premises and 2832 persons. The scheme now awaits the decision of the Ministry. Dr. Porter deplores the large number of registered food stalls in the market streets. The highways committee refuses registration when storage accommodation is unsatisfactory, and the necessary improvements cannot be carried out. Dr. Mabel Brodie has been appointed to conduct a diphtheria immunisation clinic and at the end of the year 60 children under 5 and 29 over 5 had been completely immunised. The public analyst, Mr. J. F. F. Rowland, would like to see a standard fixed for manufactured food products, such as lemon-cheese, which may now contain hardly any of the expected ingredients.

St. Pancras.

Dr. G. Sowden mentions that the borough council's Somers Town housing scheme reached a further stage, when the first block of 44 tenements was opened by H.R.H. Princess Mary on July 25th, 1928. Two further blocks of 44 flats are nearing completion. The weekly rents, inclusive of rates and water, are 13*s*. 7*d*. for a two-roomed tenement, 16*s*. 5*d*. for a three-roomed, and 18*s*. 8*d*. for a four-roomed. Each tenement includes a kitchen with gas cooker, copper, bath, sink, larder, and dresser. There is a shortage of housing accommodation for poorer persons with irregular employment or large families, and the housing provision made by the L.C.C. estates is beyond their reach. A cheaper house is urgently needed for such families, says Dr. Sowden, and should be centrally situated in order to lessen the cost of travelling to and from work. Dr. Sowden objects to the method of calculating maternal mortality from childbirth. The rate is given per 1000 live births, but is swollen by the inclusion of deaths incidental to pregnancy in its early stages. For example, of 33 cases of puerperal fever recorded in St. Pancras during 1928, only 22, and of five maternal deaths only two, followed the birth of a viable child. The remaining 11 cases and three deaths followed the occurrence of miscarriages, the total number of which is an unknown quantity. Further, one of the four deaths classified as puerperal sepsis was found on investigation to be due to procured abortion.

St. Pancras was visited by a severe epidemic of measles, which began in December, 1927. Measles is notifiable in St. Pancras, and for the first time during an epidemic preference was given to measles over scarlet fever, as regards admission to hospital. Dr. Sowden is disappointed with the results obtained but admits that statistics on a larger scale are necessary before any definite opinions can be expressed. Baldly, the results were as follows: 426 cases were admitted to M.A.B. hospitals and 33, or 7·7 per cent., died; 242 cases were admitted to Highgate Hospital, of whom 58 died, or 23·9 per cent.; while 2930 were nursed at home, of whom 24, or 0·8 per cent., died.

Wandsworth.

Dr. F. G. Caley says the residents of Wandsworth are fortunate in having 1202 acres of parks and open spaces in their area of 9199 acres, and also in having easy access to Wimbledon Common and Richmond Park. The council's obstetric consultant, Dr. Leonard Phillips, investigates any maternal deaths which present special difficulty. There were 88 cases of small-pox with no deaths, and in several instances persons actually suffering from small-pox were found following their usual occupations. At two diphtheria immunisation clinics, by the end of the year, 713 cases had been treated; 621 were negative on retesting and 92 were still positive when last tested. In three instances children, who had been treated but were not thoroughly immunised, had attacks of diphtheria so mild as to be negligible. Special arrangements had been made beforehand to deal with the usual biennial epidemic of measles. Measles is not notifiable in Wandsworth, but a successful effort to search out the cases at an early stage was made by close coöperation between the health visitors and school nurses, and eventually five temporary health visitors were engaged to deal with the epidemic. Nursing or admission to hospital when required were arranged for without delay. The cases found during the nine months of the epidemic numbered 4566, and the deaths during the same period were 38. This is a smaller fatality than in previous epidemics of similar magnitude. The number of cases removed to hospital was 236, but the case-fatality of the hospital-treated cases is not given. About 300 premises were affected by the Thames flooding. Energetic relief measures were adopted and 40 children from the area involved were sent into the country for a fortnight by the Children's Country Holiday Fund.

Woolwich.

Dr. J. Macmillan mentions as one of the important events of the year the opening of the Woolwich War Memorial Hospital. It is a general hospital with a small maternity section and an X ray electro-therapeutic department. The Woolwich Council have made capital contributions and reserve 12 beds for children under 5 years of age and accommodation for 66 maternity cases per annum. They have already provided for another 144 maternity cases at the British Hospital for Mothers and Babies. Both these hospitals have an antenatal clinic attended by the mothers who are to be admitted and both provide antenatal in-patient treatment when needed. The electrotherapeutist of the War Memorial Hospital, Dr. J. E. A. Lynham, conducts the municipal light clinic which was opened in October, 1927. He reports good results in debilitated children, marasmic babies, and rickets. Of 471 cases who have been under treatment, 177 are classed as much improved or cured, 89 as improved, 39 as stationary, 93 as still under treatment, and 73 as having ceased treatment. Dr. Lynham explains the large number who have abandoned treatment by the fact that at the beginning there was a boom and the mothers expected miracles, but on being disillusioned they found it inconvenient to attend, especially from a distance.

The Eltham housing estate of the borough council will be completely developed by the erection of another 142 houses. The estate covers 334 acres and will include 2176 houses, about half of brick and half of "Easiform" concrete. There are 1438 "A" houses with three bedrooms, 696 "B" houses with three

bedrooms and a parlour, and 42 "C" houses with four bedrooms and a parlour. The rent, inclusive of rates, is "A" 14*s.* 1*d.*, "B" 16*s.* 4*d.*, "C" 18*s.* 7*d.* There is no gas and the council supplies electricity for lighting and also for cooking and heating when required. Illustrations of the lay-out plans of the houses and photographs are given. Complaints of mosquitoes have gradually disappeared since the improvement of the drainage of the marshes and the substitution of concrete inverts for the ditches.

A REVIEW OF SCHOOL MEDICINE IN 1928.

THE general impression left by the reports of school medical officers for 1928 is that school medicine is making steady progress on several sides. Its range is now extended to cover more ages, so that the ideal of continuous medical care from birth to adolescence appears to be almost in sight. The chain begins with the maternity and infant welfare centres, which are more and more becoming linked—by continuity of staff and transfer of records—with the work in the schools themselves. Coöperation often takes the practical form of extending the school service's facilities for treatment to pre-school infants. The advantages of this are obvious, for example, in the early treatment of squint and of the effect of poliomyelitis.

Then there are the gradually increasing nursery schools, following the lines of pioneers like the Macmillan school at Deptford. As yet they are few in number but their great value for many districts is becoming recognised. At 5 years of age the children enter the infants' elementary schools, where the commencing curriculum contains little beyond play and health culture. They then pass through the steadily improving ordinary schools, where they receive continued medical care, the more gifted going on to central or even secondary schools. The other children formerly passed out of view, but already in some places, such as Blackburn, efforts are being made to secure continuity by linking up with the work of the labour exchanges and the factory surgeons, and when, as is promised, the lower age of insured persons meets the school-leaving age, real continuity will be possible for all.

The continuity goes further than this, for it is noted in several reports that the new entrants—the children of mothers who have themselves learned hygiene, mothercraft, and self-respect in the schools—show in their cleanliness and well-cared-for appearance the result of the influence of the school medical service—especially of the nurses and of the teachers. By these means a steady rise in the percentage of clean and well-nourished children is being produced, so that the contrast between the children of to-day and those of 25 years ago brought out in some retrospective reviews—for example, the story at Leeds—is really remarkable.

The activities of the school medical service have not only been extended (so to speak) lineally, but they have increased in quality and also in variety and scope. A notable example is the growth of schemes for dealing with rheumatism. Already they have spread from Bristol over the neighbouring counties, and they are also rapidly developing in London and other large cities, both observation clinics and special country hospitals being provided. The rheumatism scheme is noteworthy as an example of how well medical men—in private practice, as hospital physicians, and as public health officials—can coöperate for the general good.

The inauguration of additional orthopædic schemes on the lines suggested by the Board of Education has been a great step forward. An increasing number of authorities have made the necessary provision of an orthopædic consultant, with a properly furnished clinic, hospital accommodation for in-patient treatment, and a special (physical defective) school. In some rural areas, such as Gloucestershire, it is found to be a useful expedient to have the services of specially trained nurses to visit the homes of cripple children. Coördination and coöperation in the various branches of the public health service itself are being increased, as, for example, at Hull where the work of the service is divided into four sections with arrangements by which each can come to the help of the other.

Physical Training and Open-air Schools.

Coöperation is spreading to all the activities that are concerned with the healthy development of the child. School drill and exercises are being more closely supervised by experts, who themselves sometimes go further and deal specially with cases of postural defects. It is a pleasing feature of recent reports that still more of them contain a section by the superintendents of physical training, and mention many agencies, sports, games, swimming camps, under their supervision, for as one of them says, "good posture goes with good health and an alert mind." The need for open spaces is being forced upon public notice by the work of the Playing Fields Association, and (less happily) by the increasing number of street accidents to children. Fortunately the need is being realised—e.g., at Scarborough, which is also one of the places remarkable for the immense amount of help that is given by voluntary workers.

Open-air schools, moreover, are being established in town after town, and under the best possible conditions; for instance, of that designed at Smethwick, the medical officer says "it will compare favourably with the best in the country." The new ordinary schools, designed in the light of the knowledge gained by experiments at Torquay and elsewhere, will have in their buildings excellent conditions of hygiene and sanitation; such a school is mentioned in the report of the M.O.H. of Dover.

Treatment and Special Accommodation.

In treatment again there has been both extension and improvement. It will before long be the exception for children to be sent home after operation for tonsils and adenoids without at least 24 hours as in-patients. It is true that under some authorities good results seem to be obtained without this precaution, but such happy circumstances can scarcely be universal and the further provision of beds will help to reduce the prejudice against these operations, and so prevent the unfortunate friction that has been occasionally reported.

In the treatment of ear conditions, especially otorrhea, many aural surgeons obtained strikingly good results with various forms of new technique, which are described in their reports. Considering the large amount of preventable deafness that exists and its gravity as an economic handicap, these recent developments are worthy of close attention.

The year saw only a slight growth in the number of centres and classes for stammerers. A good deal is going on in London, and on a small scale in places like Eastbourne, and it is to be hoped that the examples will be followed, for this is pre-eminently a subject for a specially trained teacher, to work under the close supervision of an expert medical man.

Dental work is steadily making itself felt. It could not be expected that the splendid results of the special arrangements at Cambridge would be found elsewhere, but the majority of the reports indicate marked progress; no longer are the dentists obliged to spend all their time merely extracting septic and unsavable teeth, their objective is more and more preventive and even educational. Skin diseases, which were such a great source of trouble both to the school and the family doctor, are becoming much less of a bugbear. Dirt diseases like impetigo are disappearing with the better standards of hygiene in the homes; while ringworm is being dealt with successfully. Some medical officers have been getting good results with thallium acetate, but in the majority of cases X ray treatment is adopted, and, it is remarked,

not infrequently sought for by parents on the advice of their private doctor.

In spite of all the progress, there are two or three conditions and defects for which accommodation is sadly needed and most difficult to obtain. The recent extension of the Epileptic Colony and School at Lingfield is all to the good, but the vast majority of epileptic children in the country have no provision made for them. The same thing is true for the victims of encephalitis lethargica. This disease has been studied very seriously but therapeutic experiments have yielded little but disappointment. One of the chief results of experience has been to prove that most of those suffering from its after-effects are quite unsuitable for institutions receiving the insane or the mentally defective, and yet there is very little of the special accommodation that they require. Still more hapless, if possible, is the fate of those who have combined disability, such as paralysis and mental defect. They create difficulty in schools for cripples, for the mentally defective, and in residential schools; while it is pitiable to think of them as entirely ignored. For all these groups it is to be earnestly hoped that something may be done when the reorganisation of the poor-law is accomplished.

In the reports of the school medical officers are often to be found researches on topics of general medical interest, such as rickets, dental caries, nutrition, the sequelæ of encephalitis lethargica, mental deficiency, rheumatism, and even such special subjects as the auditory ossicles. These are summarised in the report of the Chief Medical Officer of the Board of Education, and are noted from time to time in our own columns, but they deserve a wider audience than they generally receive.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 21ST, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 195 (last week 265); scarlet fever, 2916; diphtheria, 1681; enteric fever, 31; pneumonia, 1077; puerperal fever, 35; puerperal pyrexia, 114; cerebro-spinal fever, 13; acute poliomyelitis, 3; acute polio-encephalitis, 4; encephalitis lethargica, 15; dysentery, 5; and ophthalmia neonatorum, 84. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Dec. 24th–25th was as follows: Small-pox, 367 under treatment, 5 under observation (last week 379 and 8 respectively); scarlet fever, 2563; diphtheria, 2597; enteric fever, 39; measles, 614; whooping-cough, 132; puerperal fever, 23 (plus 9 babies); encephalitis lethargica, 119; poliomyelitis, 3; "other diseases," 8. At St. Margaret's Hospital there were 12 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 6 (2) from enteric fever, 42 (10) from measles, 10 (1) from scarlet fever, 18 (2) from whooping-cough, 53 (11) from diphtheria, 42 (9) from diarrhœa and enteritis under two years, and 67 (10) from influenza. The figures in parentheses are those for London itself.

Two of the deaths outside London from enteric fever were in Liverpool and the others in Bootle and Cardiff. Wigan and Manchester both returned 6 deaths from measles, and Merthyr Tydfil, 4. In Liverpool there were 6 deaths from diphtheria, and in Bristol and Leeds 3 each. Liverpool also reported 6 deaths from diarrhœa and enteritis. The largest number of deaths attributed to influenza was in Brighton, where 8 were notified. In Birmingham there were 5, in Manchester 4, and in Leeds 3, while Sheffield (last week 5) reported 2.

The number of stillbirths notified during the week was 251 (corresponding to a rate of 42 per 1000 births), including 32 in London.

Parliamentary Intelligence.

HOUSE OF COMMONS.

MONDAY, DEC. 23RD.

Pensions and the Seven Years' Limit.

Mr. BEAUMONT asked the Minister of Pensions the difference between his policy and that of his predecessor with regard to the seven years' limit for applications.—Mr. F. O. ROBERTS replied: I would refer the hon. Member to the statement which I made in the House on Nov. 18th. The primary points of difference in procedure in dealing with this class of application are that no claim will be rejected solely on the ground of the time limit; that every applicant will be invited to state his case and to give evidence in support of it in response to specific inquiries tending to elucidate the claim; that full consideration (including medical examination wherever necessary) will be given to all evidence submitted, and war pensions committees have been instructed to consider and investigate complaints from applicants whose claims have been rejected, and to report specifically on them to the Ministry; and, finally, that in the determination of all cases of material doubt or difficulty independent medical experts, nominated by the Presidents of the Royal College of Physicians and the Royal College of Surgeons, will be regularly associated with the Ministry.

Factory Inspection in India.

Mr. DAY asked the Secretary of State for India whether according to the latest information he had, the factory inspectorate in India had been increased during the previous two years; and if he could give the total present number.—Mr. WEDGWOOD BENN replied: According to the latest information available the total of the inspectorate is 48, including nine part-time additional factory inspectors. This represents a reduction of one on the figure for a year previously.

Tuberculous Milk.

Dr. HASTINGS asked the Minister of Health the average percentage of non-designated non-pasteurised milk on sale to the public which contained the living germs of tuberculosis; and whether this percentage was increasing or decreasing.—Miss SUSAN LAWRENCE replied: The average proportion of milk samples taken by the larger local authorities and found to be tuberculous has recently been in the neighbourhood of 8 per cent. The results obtained by different authorities fluctuate considerably, and it would be difficult to say that the percentage for the whole country is either increasing or decreasing.

Dr. HASTINGS asked the Minister of Health if he could say, approximately, what percentage of the milch cows of this country were reactors to the tuberculin test; and whether this percentage was increasing or decreasing.—Miss SUSAN LAWRENCE replied: The number of milch cows in this country which have been submitted to a tuberculin test is relatively few, and it is not possible therefore to say what proportion would react to the test or whether the proportion is increasing or decreasing.

Doctors' Telephones in Outlying Districts.

Mr. RAMSAY asked the Postmaster-General if he was aware of the conditions which prevailed in the Western Isles; and whether he would consider the advisability of establishing a telephone in each doctor's house and schoolhouse, or other convenient centre, in every parish of these isles, in the interests of the medical, surgical, commercial, and social services.—Mr. H. B. LEES-SMITH replied: The distances between parishes in these islands are often great and the cost of providing telephone services is usually prohibitive, but any case in which there is a reasonable prospect of the revenue not falling too far short of the expenses is sympathetically considered.

Census and Occupational Mortality.

Major HILLS asked the Minister of Health: (1) whether it was proposed to utilise the forthcoming census to provide and publish statistics of occupational mortality in respect of both sexes; and (2) whether he was aware that, whereas, consequent on the census of 1921, the Registrar-General presented a report, with tabulated statistics, on infant mortality, with reference to the father's occupation, no such report was presented with respect to maternal mortality; and whether, in view of the unduly high rate of maternal mortality prevailing, he would consider the presentation of such a report in connexion with the forthcoming census at an early date after the completion of the taking of the census.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: The question of compiling, consequent upon the 1931 census, statistics of the mortality of married women by

reference to the occupation of the husband will be fully considered, though such supplementary tabulations cannot be undertaken until the completion of the census tabulations, which constitute in part the material required for their preparation. With regard to the second question, the matter will be very fully considered before the programme of supplementary tabulations is decided upon. But I may observe that it was not found advisable in 1921 to attempt any compilation of the mortality of the female population by reference to female occupations for the reason, among others, that approximately 10 per cent. only of the female population was returned as gainfully or industrially occupied.

Thames Floods and Public Health.

Sir KINGSLEY WOOD asked the Minister of Health whether he had any information as to the damage to health and property owing to the excessive Thames floods, particularly at Canning Town and the Tidal Basin areas; and whether he was taking any steps to consult the West Ham Council and other authorities with a view to the prevention and mitigation of such floods in the future.—Mr. GREENWOOD replied: I am not aware that there has been any flooding in the Canning Town and Tidal Basin areas during the recent abnormal weather conditions. The town council of West Ham have special powers with regard to the prevention of floods and the responsibility must rest with them, and with other authorities similarly situated, as to the extent to which such powers are exercised.

TUESDAY, DEC. 24TH.

Purchase of Radium.

Mr. MANDER asked the Minister of Health whether it was intended to restrict the purchase of radium from Radium-Belge to one firm; and, if so, the reason for that and for the exclusion of other firms.—Mr. GREENWOOD replied: I would remind the hon. Member that, as has already been stated in the House on more than one occasion, the Radium Trust are not appointed by me, but are constituted by Royal Charter. I am not in a position to anticipate any future decision which may be taken by the Trust on the matter referred to in the question.

Review of Service Pension Awards.

Sir GEORGE BOWYER asked the Minister of Pensions how many cases of ex-Service men's pensions had been reopened, although outside the time limit, during the last five months.—Mr. F. O. ROBERTS replied: About 180 fresh awards were made during the period referred to and, in addition, medical treatment was provided in some 60 cases of slight wound.

Regulation of Scottish Charities.

Sir GEORGE BERRY asked the Secretary for Scotland whether he proposed to initiate legislation, applicable to Scotland, to provide for the regulation of such charities as made an appeal for public support on the lines of the Collecting Charities (Regulation) Bill now before Parliament, and which was applicable to England and Wales only.—Mr. ADAMSON replied: I am considering the question of initiating legislation for Scotland on the lines of the Collecting Charities (Regulation) Bill relating to England and Wales now before Parliament, but in the present state of Parliamentary business there would, I fear, be little prospect of finding time this session for any such legislation.

Health of the Mercantile Marine.

Lieut.-Colonel FREMANTLE asked the President of the Board of Trade if the committee set up by his predecessor a year ago to advise the Board of Trade and the Ministry of Health on matters affecting the health of the mercantile marine had yet reported; whether the report would be published; and what action had been, or would be, taken to improve the conditions affecting the health of the crews and passengers concerned.—Mr. W. GRAHAM replied: The committee to which the hon. Member refers was set up to consider and advise on any questions affecting the health of the mercantile marine which the Board of Trade or the Ministry of Health might from time to time refer to them. The committee's advice on the various questions referred to it is submitted to the departments as its consideration of each subject is completed and no general report is published. The subjects with which the committee has already dealt include the Ship Captain's Medical Guide, which has been revised and issued, the Scales of Medicines and Medical Instruments and Stores for ships which do not carry surgeons, which also have been revised and issued, and the preparation of a code for facilitating medical consultation at sea by wireless telegraphy. This has been completed and forwarded to the International Code of Signals Committee. The subjects at present under consideration include an investigation of the statistics relating to the mortality of seamen and the hygiene of crew spaces on board ship.

Criminal Lunatics in Scotland.

The Duchess of ATHOLL asked the Secretary for Scotland the total number of convicted prisoners, Borstal inmates, and criminal lunatics in Scotland for the last three years for which figures were available and the number and percentage of these who were natives of the Irish Free State.—Mr. ADAMSON replied: The following table gives the information desired for the years 1926, 1927, 1928, so far as available:—

A = Convicted prisoners. B = Borstal inmates.
C = Criminal lunatics.

Year.	Total of persons received into custody during the year.		Irish nationality. Number* and percentage.
1926	A	15,685	3566 (22·7)
	B	126	21 (16·6)
	C	17	4 (23·5)
1927	A	14,839	3298 (22·2)
	B	139	18 (12·9)
	C	24	3 (12·5)
1928	A	14,737	3063 (20·8)
	B	140	13 (9·2)
	C	18	3 (16·7)

* The figures include persons born in the Irish Free State and Northern Ireland, and also persons born elsewhere if the father is Irish. Separate figures for Irish Free State cases are not available.

Grants for Poor Relief and Lunacy.

Mr. HURD asked the Secretary to the Treasury, in respect of each of the last five years for which figures were available, what were the sums paid by the Treasury to the county of Wiltshire by way of grants in aid of local taxation, showing separately the payments for poor relief and mental hospitals, and other purposes; and, in respect of the same period, the gross sums paid on these accounts to the counties of Hampshire and Berkshire respectively.—Mr. GREENWOOD replied: The following statement shows the amount of Government grants (excluding grants for capital purposes) received by local authorities in the undermentioned administrative counties in the year ending March 31st, 1928, distinguishing the purposes for which the grants were paid. The grants shown include, in addition to voted monies, grants out of the local taxation account and out of the road fund.

Administrative county.	For poor-law relief (excluding pauper lunatics).	For lunacy and mental deficiency.	For police, housing, public health, and all other services.
	£	£	£
Berkshire	12,139	7,614	181,184
Southampton ..	21,091	21,286	324,884
Wiltshire	19,490	17,724	253,945

The corresponding figures for earlier years are not readily available.

PAY-BEDS AT NEWCASTLE.—The governors of the Royal Victoria Infirmary, Newcastle-on-Tyne, have decided to utilise the three main pavilions in the Orthopædic Hospital for pay-beds. The decision is to a certain extent a consequence of the financial situation of the infirmary, the expenditure of the last ten months having exceeded the income by £11,416. The three pavilions will provide over 80 beds.

PROVINCIAL VOLUNTARY HOSPITALS IN 1928.—The tenth annual report of the Provincial Voluntary Hospitals of Great Britain for 1928 has just been issued by the Central Bureau of Hospital Information, with a preface by Mr. R. H. P. Orde, the director. The figures show that the in-patients had increased by 45,660 and the out-patients by 176,896. It is pointed out that, since each out-patient makes several attendances, these hospitals dealt with over 12,000,000 out-patients in the year. The total amount raised was £9,604,541, an increase of £900,473; the total expenditure on maintenance and development was £8,190,844 leaving a surplus of £1,413,697. The hospitals with a credit balance on their maintenance account numbered 598—78·79 per cent. The provincial voluntary hospitals pay about £100,000 a year in rates, and the assessments vary from zero to £20 per bed—there is no definite coördinated principle. The British Hospitals Association is taking such steps as lie in its power to have the matter considered by the proper authorities with a view to the removal of these anomalies.

Correspondence.

"Audi alteram partem."

EMPHYSEMA TREATED BY MECHANO-THERAPY.

To the Editor of THE LANCET.

SIR,—While admitting that mechanical measures may be of considerable help in certain pulmonary affections, I have no great faith in their value in cases of hypertrophous emphysema. In particular I do not think it advisable to attempt to reduce the size of the chest in this condition, nor indeed possible to succeed in the attempt without injury to this patient. In her communication to THE LANCET last week Dr. Kellgren-Cyriax refers to a patient, aged 73, "with undoubted emphysema." His chest was "barrel-shaped with the usual kyphosis. The chest wall was immobile, percussion note hyper-resonant, and breath sounds barely audible." The patient was treated "entirely on mechanotherapeutic lines, using chiefly passive and active exercise designed to strengthen expiration and in general to diminish the volume of the chest .... Treatment on these lines daily for a fortnight resulted in increased elasticity of the thorax, diminution of the barrel-shape and kyphosis, the breath sounds became more audible." While congratulating Dr. Kellgren-Cyriax on the patient's improvement under treatment, may I suggest that the attempt to reduce the size of the chest in a case of this kind implies a misapprehension of its pathology? The fact is, the enlargement of the chest in chronic hypertrophous emphysema is compensatory, an attempt on the part of Nature to minimise the evils resulting from a morbid condition. Owing to progressive loss of pulmonary elasticity the mean size of the chest undergoes a progressive increase owing to hyperactivity of the inspiratory muscles. Ultimately the barrel-shaped chest with kyphosis is produced in which the pulmonary capacity is greater than that which could be produced normally by the fullest possible inspiration. This process involves a fixation of the chest in the expanded position, the fixation being effected by a shortening of the chronically over-acting costal elevators (similar to the shortening which occurs in the muscles of the calf in talipes equinus), and by alterations in the costal joints and in the curves of the ribs. The enlarging thorax leads to a progressive tightening up of the elastic tissue in the alveolar walls which, owing to the loss of their elasticity, would otherwise become wrinkled, and thus encroach upon the alveolar cavities and in this way impede respiration. The fixation of the chest, while compensatory, is yet not an unmixed blessing, for while fixation saves the inspiratory muscles, it limits the expiratory movements and thus tends to render cough ineffective. We may be sure that the gain in the one case is greater than the loss in the other. While, during the advance of the disease, thoracic expansion progresses, costal breathing becomes correspondingly diminished and diaphragmatic breathing correspondingly increased; finally, costal breathing practically ceases and the breathing becomes entirely diaphragmatic, diaphragmatic expirations now being effected, not, as in normal subjects by elastic recoil only, but also by the vigorous contraction of the abdominal muscles.

These considerations lead me to conclude that, in estimating the effects of treatment on the dimensions and mobility of the patient's chest, Dr. Kellgren-Cyriax relied upon impressions rather than upon accurate measurement, since the enlargement of the chest in chronic emphysema is compensatory, the reduction of this man's chest even for a few minutes to the capacity proper to his early manhood would inevitably lead to fatal asphyxia.

I am, Sir, yours faithfully,

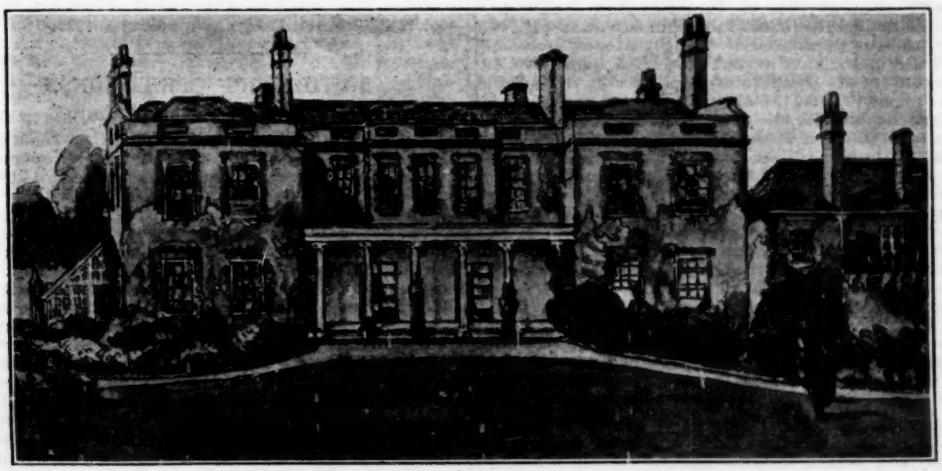
Harley-street, W., Dec. 28th, 1929. HARRY CAMPBELL.

UPTON HOUSE, PLAISTOW, THE BIRTHPLACE OF LORD LISTER.

To the Editor of THE LANCET.

SIR,—There are few now left who can remember Upton House, the birthplace of Lord Lister, as it was when his father, Joseph Jackson Lister, was living there. The main portion of the house still stands, shorn of some of its rooms and of the stables, and is the vicarage of St. Peter's, Upton Cross; faithfully are the associations with Lord Lister cherished by the vicar.

But the whole neighbourhood is completely changed, and what is now a densely populated London district was then hardly more than a country village. The beautiful garden at the back of the house has long been divided off and built over, but some of us remember the spacious lawn with its two great cedars, the kitchen garden beyond, the little summer-house, and the "terrace walk" with its broad holly hedge. It was over this hedge that the last wild red deer hunted from Hainault Forest bounded in 1828, and took refuge in the stable yard of Upton House. That was



Upton House as it was in Joseph Lister's childhood, after a drawing by Mary Lister. (From R. J. Godlee's "Lord Lister." Clarendon Press.)

when Joseph Lister was one year old. To the south of the garden was a meadow with scattered elms where cows grazed, and beyond were fields leading to the Thames Marshes.

There was a sense of peace about the old Georgian house and the grounds where the family of seven brothers and sisters spent their happy childhood. Besides the rooms usually occupied by the family there were attics where romps could take place undisturbed, and old lofts above the stables where tame owls and other pets were kept. Along the edge of the parapet the children would make their way round the roof, certainly without the knowledge of their elders. The study, with its French windows,

Upton House as it now is. (From Handbook of Lister Centenary Exhibition at the Wellcome Historical Medical Museum.)

seen under the colonnade to the left in the picture, was a sanctum where microscopic researches were carried on and grave converse held, and where children were only admitted by special permission.

It was in the room above, the "Museum room," that in 1868 Joseph performed the operation of tying the carotid artery of a calf with a ligature made of catgut, the results of which proved the efficiency of seasoned catgut as a material for ligatures (see "Lord Lister" by Godlee, ed. 3, p. 229). The room with larger windows to the right was the old nursery, and behind it, facing Upton Lane, is the room where Joseph Lister was born in 1827, and where his father died in 1869. I am, Sir, yours faithfully,

Dec. 27th, 1929. G. LISTER.

*** An appeal for the preservation of the house which Miss Lister here describes has been issued over the signatures of the Bishops of Chelmsford and Barking, Lord Moynihan, and Sir James Slade, and with the support of Sir Humphry Rolleston, Sir William Lister, Sir StClair Thomson, and others. The house was purchased by the St. Albans diocesan authorities in 1885 and would have been sold by them on account of its dilapidated condition in 1918 had not the present vicar, the Rev. A. J. Parry, intervened and himself paid for the necessary structural repairs. A sum of £1800 it is stated would now capitalise the estimated annual dilapidations and preserve the house as the vicarage of the benefice. Should more money be subscribed the surplus would be used for setting up some memorial of Lister in the house itself. Cheques may be drawn in favour of "Lord Lister's Birthplace Preservation Fund," and sent to the hon. treasurers of the Fund at Upton House, Forest Gate, London, E.7.

Upton House, it may be recalled, is thus described in Dr. H. H. Bashford's "The Harley Street Calendar" (London: Constable and Co. 1929.), p. 209:—

"Shorn of a wing and most of its garden, and the whole of the fields in which it stood, it is now the vicarage of an industrial parish, long since enveloped by the East of London. But at Lister's birth it was one of a little group of gracious and prosperous early eighteenth-century houses, surrounded by the farmlands of Thames-side, Essex, with the wild fowl nesting in Barking Marshes, and the panelled bedroom in which he was born looking westwards over Ham Park. This was the home—now an 'open space' carefully protected by Corporation railings—of his father's friend and fellow quaker, the Lombard-street banker, Samuel Gurney. And before the coming of the railway, when Lister was 12 years old—the fourth child in a family of seven—Mr. Lister and his neighbours, when the weather was fine, rode to their offices on horseback, or were collected by a coach, waiting at convenient points, and signalling its arrival by a horn."

—ED. L.

THE POSITION OF THE MEMBERS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

To the Editor of THE LANCET.

SIR,—The position of the Members of the Royal College of Surgeons of England was set out clearly in your issue of Nov. 30th (p. 1149). A resolution advocating the representation of Members on the Council has now been passed by large majorities at 41 annual meetings of Fellows and Members. The reply of the Council to the resolution which was passed at the annual meeting of Nov. 21st last is given in your issue of Dec. 21st (p. 1341) when reporting the proceedings at the subsequent meeting of the Council of the College. In that reply the Council points out that no evidence is before them that any considerable number of Members desire a change in the constitution of the Corporation.

Now the only way to produce substantial evidence is to submit to the Council a widely signed request for consideration of a claim which everyone must admit to be just. A card of inquiry will accordingly shortly be issued to all Members and we trust that it will meet with a large response and that the position of the Members will be viewed broadly. At this stage the question of whether a Member is personally interested does not arise, for the whole body of Members are corporately interested in obtaining a recognition of their desire to be more intimately associated with the conduct of the College. Nor at this stage do any questions arise as to what measure of representation should be accorded and the machinery for securing it. All that is needed is an adequately large expression of the view that the desired modification in the constitution of the College should be brought about. We feel that the honour of the College is in question, and we confidently hope that this large view will be taken.

Financial help will be required to meet the expenses of the movement. We estimate that the sum of £250 will be needed and I shall be glad to receive subscriptions towards that total.

I am, Sir, yours faithfully,

ERNEST E. WARE,
President of the Society of Members, R.C.S.

60, Welbeck-street, London, W., Dec. 28th, 1929.

MUTILATING OPERATIONS.

To the Editor of THE LANCET.

SIR,—In your last issue Dr. F. G. Crookshank has written an interesting letter on mutilating operations from the psychological point of view. May I add some remarks from the surgical standpoint?

I am entirely in agreement with Dr. Crookshank's protest against the performance of unnecessary circumcisions. I have believed for many years that the word "phimosis" is much abused, and that only a small proportion of the circumcisions that are performed are surgically justified. I doubt whether adequate instruction is usually given to students on the subject, and I think that too often, at any rate in hospital practice, a ready-made diagnosis of phimosis is accepted without due consideration. Nearly always in the babies seen at hospital the mother complains that the baby screams when he passes his water or appears to strain. Sometimes this is due to acidity of the urine, and usually on examination the foreskin is found not to be narrow, but merely to have the normal adhesions to the glans;

at the worst a somewhat narrow preputial orifice can be rendered normal by a single stretching after the adhesions have been separated. Apart from psychological considerations against the performing of unnecessary circumcisions, the operation when performed upon babies in out-patient departments, as is usually done, is attended with serious dangers, and lives may occasionally be lost from post-operative hæmorrhage or sepsis. I have found in private practice that the simple operation of freeing adhesions and stretching the prepuce when necessary proves perfectly satisfactory, and is greatly preferred by most parents when the facts have been explained to them. I believe that the other arguments brought forward by Dr. Crookshank are of great importance, and that the operation of circumcision, when it has no ritual significance, should seldom be performed.

I am, Sir, yours faithfully,

GEOFFREY KEYNES.

Park-square West, Dec. 27th, 1929.

To the Editor of THE LANCET.

SIR,—I quake at my temerity in almost opposing Dr. F. G. Crookshank, but I think that some rather obvious data have been overlooked by him. Of course, quite unitalicised physicians and surgeons and laymen had already noticed neuroses and psychoses—though they may not have so labelled it—following on "unprovoked and unwarrantable trauma"; and with a sexual basis when the trauma had been genital. Moreover, male patients have been known who worried gravely over a relative inferiority in size of penis. The few of these who have consulted me were uncircumcised. Dr. Jago thought the cause of the Swahili's comparative ineptitude lay in the psychic changes induced by the physical trauma of circumcision in boyhood. Not very far off, however, were the Masai—circumcised before manhood. His white ruler and trembling black neighbours would not think it profitable to look for penile "organ inferiority" psychoses in the Masai. Age-long experience of Armenians, and Balkan Rayahs, of both sexes, did not disclose to them any sort of sense of any organ inferiority in the Ottoman Turk—circumcised in boyhood. We all, too, know of the vigorous tribes who cloud the north-west frontier of India. They are circumcised in boyhood; they have gained, nevertheless, a sense of humour. What a pity, then, that we shall not hear them on the sense of organ inferiority acquired by circumcision! Dr. Crookshank, however, has not made it clear enough whether he would consider all or any of these circumcised to have been subjected to "unprovoked and unwarrantable trauma." There is some slight suggestion in his letter that circumcision after infancy could be performed skilfully enough to keep outside his category of trauma unprovoked and unwarrantable.

There are the many, alive and for study, whose religion has enjoined circumcision in infancy. Outsiders have not yet noticed in them an undue proportion of sufferers from the sense of organ inferiority. And ready to Dr. Crookshank's hand are the Hebrew scriptures—surely extensive enough and naive enough material in which to look for signs of the sense of penile "organ inferiority."

Yet here again Dr. Crookshank is rather baffling; for with him circumcision in infancy seems to be "to strip a baby boy's penis." So it may be after all only a matter of operative technique and a too eager thoroughness. Metchnikoff—it is true of the school of Pasteur, Lister, and Koch, rather than of Freud, Jung, and Adler—saw in the prepuce and the hymen but evolutionary developmental faults, functioning no more than as obstacles to love. Sir Arthur Keith, of the school of Hunter, while agreeing as to the faults in development, cheered us all up by pointing out that love thrived on obstacles—perhaps a distinct approach to Dr. Crookshank's position.

I am, Sir, yours faithfully,

H. M. HANSCHELL.

Weymouth-street, London, W., Dec. 31st, 1929.

TREATMENT OF DRUG ADDICTS IN NEW YORK CITY.

To the Editor of THE LANCET.

SIR,—I read, with great interest, in your last issue the report of the Committee appointed in New York to investigate various methods of treatment for drug addiction. The experiments were carried out on a large scale, 100 patients being treated by each method tested. Narcosan, a much vaunted "specific," appeared to make symptoms worse and proved to be no specific. Treatment with various substitutes failed to relieve the patients and sudden and knock-out methods caused much suffering.

The gradual reduction method, attending to each symptom as it arose, involved the least suffering and proved to be the safest. This is the method I have always advocated, and I have employed it at Bay Mount for many years with success. In the hands of an experienced physician it can be administered in such a way that the patient does not suffer at all and experiences very little discomfort. In fact, patients are usually unaware when the drug is finally withdrawn.

If addicts could only realise that they can be treated without suffering they would present themselves more readily for treatment.

I am, Sir, yours faithfully,

STANFORD PARK, M.B., Ch.B.,
Resident Medical Superintendent, Bay Mount,
Dec. 28th, 1929. Paignton, S. Devon.

COMPLICATIONS OF OPERATIONS FOR PILES.

To the Editor of THE LANCET.

SIR,—A perusal of the report of the meeting of the Proctological Section of the Royal Society of Medicine on the above subject in your last issue (p. 1360) makes me wonder more than ever why any surgeon nowadays recommends operations for cases of internal hæmorrhoids. For the past 15 years I and a few others in England, and a host of surgeons in America, have been pointing out that *every* case of uncomplicated internal hæmorrhoids can be cured with certainty and complete safety by means of injections—i.e., by a purely ambulatory treatment. This was true even before the high submucous injection of 5 per cent. phenol in vegetable oil had been described by me in 1928 [1]—I believe for the first time in England; but it can now be added that by this method there is a complete absence of all serious complications, and that even pain is quite exceptional, whilst recurrences are at least as few as after operations of the old sort.

When one reads an appalling list of complications, like those mentioned at the meeting referred to above, one cannot help feeling that the discussion might almost have been designed as a text for the advocates of the treatment by injection. Every speaker at the meeting dwelt upon the impossibility of consistently avoiding the occurrence of very severe pain after operation, and there was considerable diversity of opinion as to the choice of method of operation with a view, firstly, to limiting the amount of pain; and, secondly, to limiting the incidence of cases of dangerous primary and secondary hæmorrhage and of severe stricture following operation. Mr. Milligan placed the incidence of the last of these as high as between 9·2 and 11·3 per cent.! Mr. Cecil Rowntree put the matter excellently when he said that "the patient who exchanged his piles for a stricture was reminded every day of his life what a bad bargain he had made." The same speaker referred to a fatality he had seen from intestinal obstruction following an operation for piles, whilst Mr. Norbury said that he had had two cases of suppurative pylephlebitis, one of which proved fatal. If experts like these have to admit such catastrophes and serious complications after their operations, one shivers to think what the

[1] THE LANCET, 1928, i., 543.

mortality and morbidity-rates must be where less skilled operators are concerned.

Mr. W. B. Gabriel was the only surgeon at the meeting who so much as referred to the treatment by means of injection, and even he does not seem to have been very emphatic on his preference for that method. A possible explanation for his lukewarmness may be found on p. 1367 of the same issue, where he describes a syringe he has devised for "the high submucous injection of 5 per cent. phenol in vegetable oil as described by Albright and Blanchard." As his syringe holds only 3 c.cm. of oil, and as his needle is only 3¾ inches in length, it is evident that he has not grasped the essentials of Albright and Blanchard's method, because those American proctologists have laid stress upon the necessity of injecting very large amounts (from 2 to even 10 c.cm. into each puncture) and of going as high as there is any loose mucous membrane—if necessary even above the valves of Houston. The syringe described by Mr. Gabriel does not hold enough for even one injection and would not ever reach high enough—Blanchard at times uses a needle on a shaft some 7 inches long. Nevertheless, I welcome Mr. Gabriel as a convert to the treatment of internal hæmorrhoids by injection, even in cases of "bad piles." Mr. Gabriel wrote an invaluable article on the treatment of pruritus and of fissure by means of injection of anæsthesin in oil ("A.B.A.")[1] for which I have cause to be exceedingly grateful, because by his method I have now treated a large number of fissure cases without operation or general anæsthetics, and invariably with instant relief and—so far at any rate—without a single recurrence or mishap. This has made it possible to treat by injection even cases of internal hæmorrhoids complicated by fissure—cases which previously I should have dealt with by a preliminary divulsion of the sphincters under general anæsthesia.

Where so much can be done for rectal cases by "ambulant" methods it seems a thousand pities that the majority of rectal surgeons still continue to perform operations of the old sort, even though they admit the frequency and variety of severe complications and even occasional fatalities that they incur thereby.—I am, Sir, yours faithfully,

ARTHUR S. MORLEY.

Upper Wimpole-street, W., Dec. 28th, 1929.

THE BRUIT D'AIRAIN.

To the Editor of THE LANCET.

SIR,—Is it quite correct to say that the bruit d'airain was *first* described in April, 1857, and to suggest that it was not known to Laennec? (I am writing with allusion to the excellent paper by Drs. McLaughlin and Dix-Perkin in the last issue of THE LANCET.)

On reference to Gee's "Auscultation and Percussion"—that wonderful little book which constitutes an inexhaustible mine of information—I find it stated, on page 131, that the bell sound or metallic ring *was* well known to Laennec. Dr. Gee wrote, as do Drs. McLaughlin and Dix-Perkin, that coins are not necessary for the eliciting of this sound, and admitted that there is no reason for thinking that Laennec percussed with coins. But he cited the following passage from the "Traité de l'Auscultation médiate (i., 111, 696), which seems pretty conclusive:—

"En auscultant à l'aide du stéthoscope, et percutant en même temps, on entend une résonnance semblable à celle d'un tonneau vide, et mêlée par moment de tintement."

On the other hand, Gee unhesitatingly accredit[1] Trousseau with having given the name of bruit d'airain to the metallic sound heard, on auscultatory percussion, over a pneumothorax, sometimes at any rate, and irrespectively of the use of coins.

The authors of the paper in question have done such good work in helping us to get away from the notion that the metallic bell sound has any necessary connexion with the use of coins that I hope they will forgive me, not only for having raised the point that I have, but for making two more. (1) *Airain* is not translated by brass, but by *bronze*. Frenchmen always speak of what we call brass as *cuivre jaune*. (2) *Laennec* should be spelt always thus, as I have spelt it, without either vowel-ligature or diæresis, just as are the place names, Caen, Laon, &c.

I am, Sir, yours faithfully,

Dec. 28th, 1929. ANGLO-GALLICUS.

[1] Brit. Med. Jour., 1929, i., 1070.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Rear-Admiral D. W. Hewitt is placed on the retd. list at his own request.

Surg. Capt. R. W. B. Hall to be Surg. Rear-Admiral.

W. M. Greer and J. G. Lynch to be Surg. Lts.

The following appointments are notified: Surg. Lt.-Comdr. (D.) C. Williams to *Pembroke* for R.N. Barracks, Chatham, and Surg. Lt. J. B. W. Rowe to *Peterel*.

ROYAL ARMY MEDICAL CORPS.

Col. G. G. Delap, late R.A.M.C., retires on retd. pay.

Lt.-Col. J. M. H. Conway, having attained the age for compulsory retirement, is placed on retd. pay.

Lt.-Col. W. P. MacArthur is granted the temporary rank of Col. while employed as Consulting Physician to the British Army.

Maj. L. C. Hayes retires on retd. pay and is re-employed.

Maj. B. L. Davis is placed on the half-pay list on account of ill-health.

ARMY DENTAL CORPS.

Capt. W. A. Rankin to be Maj.

MILITIA.

Maj. R. T. C. Robertson retires on attaining the age-limit and is granted the rank of Lt.-Col.

TERRITORIAL ARMY.

Capt. J. H. Iles, having attained the age-limit, relinquishes his commn. and retains his rank.

Lts. W. L. Kinnear, J. Carver, and C. D. Bruce to be Capts.

Second Lt. E. T. Colville (late R.G.A., Spec. Res.) to be Lt.

Supernumerary for Service with O.T.C.: Second Lt. W. P. Kennedy, from Gen. List, T.A., to be Lt., supern. for serv. with Med. Unit, Edinburgh Univ. Contgt., Sen. Div. O.T.C.

ROYAL AIR FORCE.

Flight Lt. G. Kinneir relinquishes his commn. on completion of service.

INDIAN MEDICAL SERVICE.

Capt. J. G. McCann to be Maj.

Lts. J. F. O. Bodman and B. N. Hajra to be Capts. (prov.).

Lt.-Col. W. G. Hamilton retires.

Fateh Mohammad Khan, Bishan Singh, and Madan Gopal Saincher to be Temp. Lts.

Temp. Capt. H. K. Datta, who has relinquished his temp. commn., is permitted to retain the rank of Capt.

The undermentioned officers relinquish their temp. commns.: Capt. C. Joshi and Lts. P. Singh, G. S. Malik, R. Lal, and K. T. Hosain.

REBUILDING OF PARIS FACULTY OF MEDICINE.—The Rockefeller Foundation has offered £1,200,000 towards rebuilding the medical school of the University of Paris. This school was built in 1877 to accommodate 1000 students, but now holds 5000. "It is well known," writes our Paris correspondent, "that the Faculty of Medicine, if rich in professors, has a dwelling only worth what the stones would fetch if it were knocked down. Many attempts have been made by Prof. Roger, dean since the war, to stir up the public authorities, and obtain the necessary money. But hitherto no success has been attained; the money did not seem ready to come. Now the Rockefeller Committee offers 6,000,000 dollars for the purpose, but only under certain conditions. Thus the new Faculty must be a whole block and must be built on a site near the present one and the Latin quarter. Such a site exists, but is at present occupied by the wholesale wine market. This, however, could be moved. The French Government will have to give an equal sum before the Rockefeller grant is made, but the general feeling of the press here is that this should be done so as not to miss the chance of making the Paris Faculty the finest in the world."

Obituary.

COLL REGINALD MACDONALD, M.D. ABERD., D.P.H.

Dr. Coll Macdonald died in London, as the result of a street accident, on Christmas Eve, 1929, at the age of 77. He was a graduate of Aberdeen, and after a period of general practice in Ayrshire became county and district medical officer there in 1891. He was thus one of the first group of whole-time county medical officers in Scotland of whom there were 16 in all. Of these two are still in office, ten are dead, two are retired, and two transferred early to other appointments, one being still in active work. These appointments were all made under the powers of the Local Government (Scotland) Act, 1889. As an encouragement to the appointment of whole-time men, the Government of the day gave a grant of ten shillings in the pound for salaries and approved outlays. The majority of the counties decided in favour of whole-time men, and the county of Ayr, a large county with manufactures, mining, iron, shipping, and agriculture, went with the majority. Macdonald's main work in the early days was the promoting of hospital accommodation for infectious diseases. The large mining population demanded a great deal of sanitary supervision, and Macdonald was one of the five county medical officers asked by the Local Government Board for Scotland to make a report on the housing of miners as a preliminary to the later survey by the Royal Commission on housing. When the later developments supervened—medical inspection of schools, tuberculosis, child welfare, venereal disease, maternity service—Macdonald became head of the school health service, and took his full part in establishing this and the other sections of health work. The county and burgh authorities combined to take over the new sanatorium at Glenafton. They combined on a large scale also for child welfare, maternity, and venereal diseases, and in these four or five sections Ayr is one of the best organised counties in Scotland. By 1926, when he retired, Macdonald had a considerable staff under him for each of these main divisions of work. In the 35 years a soundly compacted county system of public health administration and school health administration had come into existence, and the new Local Government Act has had the way well prepared for it.

In person Dr. Macdonald was genial yet reserved. He was never wanting in appreciation of the work of his colleagues, and his own reports were sound and well proportioned. "His many friends will miss his sensitive conversation and his kindly smile," writes one who knew him personally.

THOMAS EVANS FRANCIS, O.B.E., M.D. LOND.

WE have to record the death at Colombo of Dr. T. E. Francis, at the early age of 47. Dr. Francis was last year obliged by ill-health to resign the post of medical officer of health for Barnsley, and his death occurred during a first voyage as ship surgeon. Born at Blackwood, in Monmouthshire, he was the son of George Gifford Francis and was educated at Pengam School and University College, Cardiff. From there he went to St. Mary's Hospital with an entrance Scholarship, subsequently studying also at St. Bartholomew's, and in 1905 he graduated as M.B. Lond. After a period as resident medical officer at Hampstead General Hospital he proceeded to the M.D. degree in State medicine and took up an appointment as assistant school medical officer for Glamorgan. In 1911 he became medical officer of health and school medical officer for Llanelly, but he left this work from 1914 to 1918 and served as a surgeon in the Royal Navy, being attached to *Britannia*, to the hospital ship *Soudan* and to the Haslar and Plymouth Hospitals. In 1920 he left Llanelly to fill the vacant post at Barnsley.

Dr. Francis married Beatrice, daughter of Edward Fisher, and his widow survives him with three children. His eldest son is studying medicine at St. Bartholomew's Hospital.

IN the obituary notice of Dr. Scott Riddell in our issue of Dec. 14th last Dr. Riddell's rank in the Order of the British Empire was wrongly stated. It should have been given as Commander.

Medical News.

UNIVERSITY OF CAMBRIDGE.—On Dec. 19th the following degrees were conferred:—

M.Chir.—F. J. Milward.
M.B. & B.Chir.—L. J. Rae.
M.B.—L. R. Janes and C. G. Townsend.

UNIVERSITY OF LONDON.—At recent examinations the following were successful:—

M.D.

Branch I. (Medicine).—Benjamin Barling, Univ. Coll. Hosp.; F. M. M. Eyton-Jones, St. Bart.'s. Hosp.; C. F. Fernando, Univ. Coll. Hosp.; T. R. Hill, Guy's Hosp.; B. B. Hosford, St. Bart.'s Hosp.; R. M. Maher, Univ. of Liverpool; H. L. Marriott, Middlesex Hosp.; R. L. Midgley and N. D. Patel, Univ. Coll. Hosp.; W. M. Ramsden Guy's Hosp.; B. F. Russell and E. W. Skipper, London Hosp.; and E. C. Warner, Guy's Hosp.
Branch II. (Pathology.)—G. W. J. Bousfield, St. Thomas's Hosp.; Beatrice D. Pullinger and Dorothy M. Vaux, L.S.M.W.
Branch IV. (Midwifery and Diseases of Women.)—Janet I. Hoare, Winifred A. Ladds, and Edna I. Langston, L.S.M.W.; and Isabella L. H. Livingstone, King's Coll. Hosp.
Branch V. (State Medicine.)—G. L. Brocklehurst, St. Bart.'s Hosp.; and S. C. Gawne, Univ. of Liverpool.

M.S.

Branch I. (Surgery).—A. W. Holgate, Univ. Coll. Hosp.; and N. P. L. Lumb and R. W. Reid, St. Thomas's Hosp.
Branch III. (Ophthalmology.)—J. W. T. Thomas, Univ. Coll., Cardiff and Middlesex Hosp.

L.S.M.W. = London (Royal Free Hosp.) School of Medicine for Women.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the undermentioned subjects:—

Surgery.—J. S. Bury, Manchester; D. Ram Annamalai London Hosp.; B. T. Squires, Guy's Hosp.; and C. D. Trimble, Birmingham.
Medicine.—C. W. Ellison, St. Bart.'s. Hosp.; V. J. Lopez, St. Mary's Hosp.; L. J. Pearson, Birmingham; T. G. Robinson and B. T. Squires, Guy's Hosp.
Forensic Medicine.—C. E. P. Davies and W. J. D'Rosario, Guy's Hosp.; R. J. Kagan, St. Mary's Hosp.; V. J. Lopez, Guy's Hosp.; D. Ram Annamalai, London Hosp.; and B. T. Squires, Guy's Hosp.
Midwifery.—T. Chandrasekharan, Madras; G. P. Charles, Sydney and Westminster Hosp.; W. J. Frith, London Hosp.; R. J. Kagan, St. Mary's Hosp.; I. W. H. Mansfield, Middlesex Hosp.; P. Somasunder, London Hosp.; L. J. P. Soromenho, Lisbon and St. Bart.'s. Hosp.; B. T. Squires, Guy's Hosp.; and C. D. Trimble, Birmingham.

The Diploma of the Society entitling them to practise medicine, surgery, and midwifery was granted to W. J. Frith, R. J. Kagan, V. J. Lopez, and B. T. Squires.

UNIVERSITY OF DURHAM.—On Dec. 21st the following degrees were conferred:—

M.D. (Practitioners of 15 Years' Standing.)—V. A. Goonetilleke and H. M. S. Turner.
M.B., B.S.—Abe Franklin, S. M. Garstein, C. M. Gillis, and J. L. Wolfe.

UNIVERSITY OF LIVERPOOL.—The late Prof. E. E. Glynn, formerly professor of pathology in the University, left £1000 for the department of pathology.

POST-GRADUATE COURSES IN NEUROLOGY.—A post-graduate course on Diseases of the Nervous System will be held at the National Hospital, Queen-square, London, W.C., from Feb. 3rd to March 28th. It will include 32 clinical lectures and demonstrations at 3.30 P.M. on each week-day except Wednesday and Saturday. There will be teaching in the out-patient department in the afternoons, and pathological demonstrations on Mondays at noon. Two other courses—on the Anatomy and Physiology of the Nervous System, and on Methods of Examination—will be given at noon on Fridays and at noon on Tuesdays and Thursdays. Particulars may be had from the secretary of the medical school at the hospital.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—At a meeting at 17, Bloomsbury-square, London, W.C. 1, on Tuesday, Jan. 14th, at 8.30 P.M., the Harrison Lectureship Medal will be presented to Mr. P. A. W. Self, who will deliver the Harrison Memorial Lecture upon Research. The Lectureship was established in memory of Colonel Edward Frank Harrison, Director of Chemical Warfare during the late war.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The next congress of this institute will be held in Portsmouth during Whitsuntide, 1930, from Wednesday, June 4th, to Monday the 9th. The scientific work will be conducted in five sections: State medicine and municipal hygiene; naval, military and air (including tropical diseases); industrial hygiene; women and children and the public health; and tuberculosis. Further details may be had from the hon. secretaries at 37, Russell-square, London, W.C., 1.

RADIOLOGY AND TUBERCULOSIS.—The Joint Tuberculosis Council have arranged a post-graduate course to be held in the X ray department of the Hospital for Consumption and Diseases of the Chest, Brompton, London, S.W., from Monday, Jan. 27th, to Saturday, Feb. 2nd. It will be conducted by Dr. Stanley Melville, assisted by members of the hospital staff, and the class will be limited to 25 members who will form small groups. Further information may be had from Dr. William Brand, secretary of the Council, at Tavistock House North, Tavistock-square, London, W.C. 1.

UNIVERSITY OF BRISTOL.—Dr. R. J. Brocklehurst has been appointed to the chair of physiology in the University as from August 1st of this year.

A medical graduate of Oxford, where he took a first-class in the honours schools, Dr. Brocklehurst worked as assistant in physiology, first part-time, then whole-time, at St. Bartholomew's Medical College from 1925 to 1926. He was then awarded a Radcliffe Travelling Fellowship, with which he went to America and Germany. In August, 1928, he returned to take up the post of senior lecturer in physiology at University College.

DANGEROUS DRUGS REGULATIONS.—In pursuance of the Dangerous Drugs (Consolidation) Regulations, 1928, the Home Secretary has appointed two dental tribunals—one for England and Wales and one for Scotland—to which as occasion arises may be referred for examination and consideration any case in which there is, in his opinion, reason to think that a dentist may be administering any of the drugs to which the regulations apply, either to himself or to any other person otherwise than as required for purposes of dental treatment. The appointment of the tribunal is an extension to dentists of the system already adopted with regard to medical practitioners on the recommendation of the Departmental Committee on Morphine and Heroin Addiction in their report issued in January, 1926. The membership is as follows: England and Wales: Mr. W. H. Dolamore (chairman), nominated by the Dental Board of the United Kingdom; Mr. E. C. Sprawson, nominated by the General Medical Council; and Mr. N. G. Bennett, nominated by the British Dental Association, or Mr. F. Butterfield, nominated by the Incorporated Dental Association, with Mr. E. Percival Clarke, K.C., as Legal Assessor. Scotland: Mr. W. Guy (chairman), nominated by the Dental Board of the United Kingdom; Mr. J. H. Gibbs, nominated by the General Medical Council; and Mr. W. Graham Campbell, nominated by the British Dental Association or Mr. G. Hogg Patterson, nominated by the Incorporated Dental Association, with Mr. John Cowan, K.C., as Legal Assessor.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Jan. 7th.—8 P.M., TROPICAL DISEASES: PATHOLOGY. Special discussion on Tropical Diseases Arising from Dietetic Deficiency. Openers: Prof. J. W. B. Megaw (Tropical), Dr. G. Marshall Findlay (Pathology).
THURSDAY.—7.45 P.M., NEUROLOGY. Clinical Meeting at the West End Hospital for Nervous Diseases, Welbeck-street, W.
FRIDAY.—8.30 P.M., OPHTHALMOLOGY (Cases at 8 P.M.). Demonstration: Mr. F. W. Edridge-Green (introduced by Mr. Doyne): The Influence of the Parafoveal on the Foveal Region of the Retina. Papers: Mr. J. D. N. Cardell: Krukenberg's Spindles. Mr. E. Wolff: A Microphthalmic Family. Cases and Specimens: Mr. A. F. MacCallan: (1) Copper Wire in Eye—Specimen of Enucleated Eye. (2) Melanotic Sarcoma of Choroid. Other cases will be shown.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Jan. 6th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose and Throat Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Nose, Throat and Ear Clinics. Operations.
FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases. Clinics. Operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Jan. 6th.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Sinclair: Surgical Wards.
TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Dept. 2.30 P.M., Sir Henry Simson: Gynæcological Operations.
WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards. Dr. Scott Pinchin: Medical Out-patients.
THURSDAY.—11.30 A.M., Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. MacDonald: Genito-Urinary Department.
FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department. 2 P.M., Mr. Sinclair: Operations.
SATURDAY.—9 A.M., Mr. Vlasto: Throat, Nose, and Ear Operations. 9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Children's Department.
Daily, 10 A.M. to 5 P.M., Medical, Surgical and Special Out-patients, Operations, Ward Visits, Anæsthetic Courses.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Jan. 7th.—3.15 P.M., Dr. Rubens Wade: Anæsthesia.

EAST LONDON HOSPITAL FOR CHILDREN, Shadwell, E.
WEDNESDAY, Jan. 8th.—4.15 P.M., Clinical evening. Cases of interest will be demonstrated in the wards. Tea at 4 o'clock.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
THURSDAY, Jan. 9th.—5 P.M., Dr. W. N. Goldsmith: Lichen Planus.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL
FRIDAY, Jan. 10th.—4 P.M., Mr. N. Rankin: Ear-ache.

ST. MARY'S HOSPITALS, Manchester.
FRIDAY, Jan. 10th.—4.30 P.M. Post-graduate Lecture (at the Whitworth-street West Branch), Dr. W. Fletcher Shaw: Albuminuria and Eclampsia.

Appointments.

BARKER, M., L.R.C.P. Lond., M.R.C.S., D.P.H., has been appointed Deputy Medical Officer for East Ham.
BLANDY, M. A., M.B., B.S. Lond., M.R.C.P. Lond., Assistant Medical Officer, the Royal College of St. Katharine, Poplar Infant Welfare Centre.
GRIFFIN, A. J. B., M.B., B.Ch. Liverp., D.P.H., Medical Officer of Health for Worcester.
HUGHES, E. R., L.R.C.P. Lond., M.R.C.S., Medical Officer of Health for Holyhead.
POPPER, O., F.R.C.S., M.B., Ch.B. Edin., Surgeon in Charge of Ear, Nose, and Throat Department, Queen's Hospital for Children.
SPENCE, D. L., M.B., B.Ch'r. Camb., Medical Officer to the Post Office at Melksham Suboffice.
Glasgow Royal Maternity Hospital: M'CASH, MARGARET S. L., M.B., Ch.B. Glasg., and WILSON, ELIZABETH R. M., M.B., Ch.B. Glasg., House Surgeons; DOUGLAS, N., M.B., Ch.B. Glasg., and OSWALD, FRIEDA, J., M.B., Ch.B. Glasg., Outdoor House Surgeons.
Certifying Surgeons under the Factory and Workshop Acts: HASKINS, L. W. R., M.B., B.Ch. Dub. (Wadebridge, Cornwall); TURNER, J. W., L.R.C.P. Lond., M.R.C.S., (Berkhamsted); and WHITEHEAD, E. C., M.B. Lond., L.R.C.P. Lond., M.R.C.S. (Kings Cliffe, Northampton).

Vacancies.

For further information refer to the advertisement columns.

Acton Hospital, W.—Res. M.O. £150.
Bethnal Green Hospital, E.—Sen. Asst. M.O. £500.
Birmingham, Dudley-road Hospital.—Gynæcologist and Obstetrician. £700.
Birmingham City.—M.O. for Maternity and Child Welfare. £600.
Birmingham City Mental Hospital.—Jun. Asst. M.O. £350.
Birmingham, Selly Oak Hospital.—Two Cas. O.'s. Each at rate of £200.
Blackburn and East Lancashire Royal Infirmary.—Res. H.P. £150.
Bloomsbury Dispensary, 12, Bloomsbury-street, W.C.—Res. M.O. £250.
Bradford Royal Infirmary.—Res. Surg. O. £250.
Brighton, Royal Sussex County Hospital.—Cas.H.S. £120.
Burnley, Victoria Hospital.—H.S. At rate of £125.
Cambridge, Papworth Village Settlement.—Second Asst. M.O. £350. Also H.P. At rate of £100.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. First Asst. in Out-patient Dept. Also Third Res. H.S. At rate of £75.

City of London Hospital for Diseases of Heart, &c., Victoria Park, E.—Anæsthetist.
Croydon General Hospital.—Hon. Gynæcologist and Hon. M.O.
Dreadnought Hospital, Greenwich.—H.P. and H.S. Each £110.
Great Yarmouth General Hospital.—Asst. M.O. to Ear, Nose, and Throat Dept.
Harrogate Infirmary.—Jun. H.S. At rate of £100.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50.
Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also Clin. Asst. M.O. for Venereal Dept. £1 1s. per session.
Huddersfield Royal Infirmary.—Jun. H.S. for Eye, Ear, Nose, and Throat Dept. At rate of £150.
Hull Royal Infirmary.—Third H.S. Also Asst. H.P. At rate of £150 and £130 respectively.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150. Also first H.S. At rate of £120.
Leamington Spa, Warneford General Hospital.—Res. H.P. £165.
Leeds Jewish Herzl-Moser Hospital.—Res. M.O. £100.
Leicester Royal Infirmary.—Hon. Phys. and Hon. Surg.
Leigh Infirmary, Lancashire.—Res. H.S. At rate of £150.
Liverpool, Royal Southern Hospital.—Two H.P.'s. Three H.S.'s., and M.O. Each at rate of £60. Also Res. Cas. O. At rate of £100.
London County Council.—8th Asst. M.O. £300. Also Temporary Asst. M.O. 30s. per session.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150. Also Hon. Obstet. Surg.
Manchester, Babies' Hospital, Burnage-lane, Levenshulme.—Sen. Res. M.O. At rate of £125.
Manchester Royal Infirmary.—Five H.S.'s. H.S. to Aural, &c. Four H.P.'s. All at rate of £50. Also Asst. M.O. and Clinical Asst. in Aural Out-patient Dept. Each £35.
Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.
Manchester University.—Lecturer in Dental Histology. £50.
Metropolitan Asylums Board.—Jun. Asst. M.O. £500.
Mile End Hospital, Bancroft-road, Mile End, E.—Res. Deputy Med. Supt. £600.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
Norwich City.—Asst. M.O.H. &c. £450.
Redruth, Cornwall, West Cornwall Miners' and Women's Hospital.—Res. M.O. £200.
Rochdale Infirmary and Dispensary.—Jun. H.S. £175.
Royal Army Medical Corps.—Commissions.
Royal Dental Hospital, Leicester-square, W.C.—Lecturer on Anæsthetics and Bacteriology.
Royal London Ophthalmic Hospital, City-road, E.C.—Out-patient Officer. £100.
St. John's Hospital, Lewisham, S.E.—Orthopædic Surg. Also Cas. O. At rate of £100.
Salford Royal Hospital.—H.S. At rate of £125.
Sheffield, Jessop Hospital for Women.—Two Asst. H.S.'s. Each at rate of £100.
Sheffield, Winter-street, Hospital.—Asst. Tuber. O. £450.
Southwark Metropolitan Borough, S.E.—Asst. M.O.H. £600.
Stafford, Staffordshire General Infirmary.—H.P. At rate of £150.
Stroud General Hospital, Glos.—H.S. At rate of £125.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Sen. Res. M.O. At rate of £250. H.P. and H.S. Each at rate of £100. Also Out-patient Anæsthetist. 10s. 6d. per attendance.
West End Hospital for Nervous Diseases, Regent's Park, N.W.—Jun. H.P. At rate of £100.
West London Hospital, Hammersmith-road, W.—Asst. Dental. S. Also Two Hon. Anæsthetists.
Willesden General Hospital, N.W.—Res. H.S. At rate of £100.
Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200.
Wrexham and East Denbighshire War Memorial Hospital.—Two Res. H.S's. Each at rate of £150.
The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Faversham.

Births, Marriages, and Deaths.

BIRTHS.

THOMAS.—On Nov. 29th, 1929, at "San Remo," Belfast, to Elizabeth S. Thomas, M.B., B.Ch., D.T.H., wife of Captain A. F. F. Thomas—a daughter.
WILLCOCKS.—On Christmas Day, 1929, at Springfield, Chelmsford, the wife of Dr. R. W. Willcocks, of a daughter.

DEATHS.

DAVIS.—On Dec. 24th, 1929, suddenly, of pneumonia, at a nursing home in Eastbourne, Thomas Richard Earls Davis, M.B., Ch.M. (Sydney).
DUKE.—On Dec. 23rd, 1929, at Hyde-gardens, Eastbourne, Benjamin Duke, M.D., in his 84th year.
GRANT.—On Dec. 29th, 1929, after a short illness, at Kirkdale, Sydenham, William Francis Grant, M.D.
MACDONALD.—On Dec. 24th, 1929, suddenly, in London, as the result of an accident, Coll Reginald Macdonald, M.D., D.P.H., late County Medical Officer of Ayrshire.
RICHARDS.—On Dec. 23rd, 1929, at his residence, Grove-lane, Camberwell, S.E., G. W. Richards, M.D.
ROSE.—On Dec. 23rd, 1929, at Acocks Green, of pneumonia, Lauchlan Rose, M.A., M.D., late of Newport, Salop, and of Ministry of Pensions, Birmingham.
STUART.—On Dec. 29th, at a nursing home, after a short illness, James Stuart, M.A., M.B., C.M. Edin., of 92, Preston-road, Brighton, aged 73 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

TRAINING IN PREVENTIVE MEDICINE IN THE MEDICAL SCHOOLS.

By ROBERT A. LYSTER, M.D., B.Sc., D.P.H.,
LECTURER IN PUBLIC HEALTH AND LECTURER IN MEDICAL JURISPRUDENCE AT ST. BARTHOLOMEW'S HOSPITAL; LATE MEDICAL OFFICER OF HEALTH FOR HAMPSHIRE.

FOR more than 25 years I have been engaged continuously in teaching public health and forensic medicine to undergraduates in medical schools, and also in the post-graduate teaching of qualified medical practitioners in training for the Diploma in Public Health. Over the same period I have been engaged in examining for medical degrees in various universities and for the D.P.H. It may, therefore, be claimed that I have had the advantage of viewing this subject from all sides, both as teacher and as examiner of graduates and undergraduates.

As a teacher for the D.P.H. I have met men who have taken their medical training in practically all the medical schools in the United Kingdom, and I have been struck particularly by two important facts.

1. The men taking the course had no common factor as regards their previous training in public health. Coming from different medical schools they had received varying amounts of instruction and those amounts represented different parts of the subject. It was dangerous to assume that even the majority of the class knew any particular branch of the subject to any degree.

2. In most instances the instruction they had received was completely inadequate even as an elementary introduction to the general principles of public health and preventive medicine.

During the period of 25 years covered by my experience two important changes have occurred. On the one hand, the medical curriculum has become more and more loaded with advanced clinical details which the ordinary practitioner may not be able to use in his practice, with the result that the instruction in public health and preventive medicine has never been allowed to expand and occupies, in fact, at the present time a somewhat smaller proportion of the medical curriculum than it did 25 years ago. On the other hand, the interest and knowledge of the public in this subject has increased by leaps and bounds, and we have at the present time a public thirsting for skilled guidance in health matters and in the practice of prevention.

The necessity for coördinating influences exists all through the medical curriculum. Even when learning the introductory sciences upon which medicine, and particularly preventive medicine, is founded the student gets into the habit of amassing facts and forgetting principles, and the tendency of the modern examination is to accentuate this danger instead of removing it.

He goes through his preliminary courses oblivious of the fact that, based on some of the simplest chemical, anatomical, and physiological facts, very important ideas concerning health and disease and its prevention may be founded. Even in *popular* elementary courses on this subject it is far more common to find this association and interest than in the introductory courses in the *medical schools*.

Isolation of Subjects.

Speaking generally, the various subjects are isolated from each other both in teaching and in examination, but the most marked isolation of all is reserved for public health and preventive medicine (and forensic medicine.) The creation of medical and surgical units in some schools has undoubtedly brought about a considerable degree of coördination in many ways and their existence should facilitate the introduction of "the preventive idea" into the whole curriculum.

In a lecture given at the Scientific Medical Conference held at the University of Rochester in October, 1926, Dr. Andrew Balfour, in speaking about the medical curriculum, said: "The student is *fortunate* if he gets more than an inkling of the huge subject of preventive medicine. He may, however, have an opportunity of grasping the cardinal facts that curative and preventive medicine cannot be divorced from one another, and that as a practitioner he will have duties both towards his patients and the State which it is imperative that he should fulfil to the best of his ability." Even this is sheer optimism.

The Average Practitioner.

The position is completely unsatisfactory. The practitione of medicine is usually uninterested in and indifferent to all public health matters, and devotes himself to his sick patients, regarding preventive medicine as a job for someone else and in a few instances expressing hostile sentiments

against those who practise it. His training has not been such as would be calculated to inspire him with any knowledge or interest or enthusiasm in the subject with which the general public is becoming more and more interested every year. Medical officers of health are trying to satisfy this demand for information by means of their schemes of public health propaganda, but the public appetite is very largely fed at present by the popular journalist, the stunt worker, and the sentimental fanatic, and the combined effect is deplorable. It is, in fact, difficult to exaggerate the serious character of the present position, with a public avid for health teaching on the one hand, and on the other a medical profession whose training, generally speaking, has not been such as to make it keenly interested or instructed in such matters.

In many of his writings the Chief Medical Officer of the Ministry of Health has dealt with the desirability of associating the general practitioner with preventive medicine, and has shown how easily the preventive idea could permeate the medical curriculum. So far as can be seen at present the result upon the teaching in the medical schools has been very small, and prevention is never likely to become a real part of the teaching in any medical school until a specialist teacher is appointed on the staff to deal with the subject and to press its claims.

The Medical Curriculum.

The fact is that the student is taught mainly the theory and practice of the diagnosis and treatment of diseased conditions, and that he receives little or no instruction upon prevention; he is launched into a course of instruction, investigation, and experiment which tends to concentrate attention almost entirely on treatment and cure rather than on the prevention of disease, while the study of the earliest signs of oncoming illness and the investigation of conditions leading up to it are liable to be passed over and neglected in the tremendous pressure of an overloaded syllabus.

The reason for this restricted condition of the curriculum is obvious. The training of the medical student at the present time is, for all practical purposes, entirely in the hands of eminent physicians and surgeons who have specialised in their particular departments, the result of whose excellent teaching is naturally to give the student the conviction that his life's work lies entirely among diseased persons. Such a state of affairs is inevitable under the existing arrangements in the medical schools, and it is not to be expected that the clinical teachers, who are experts in the treatment of diseased conditions, can alter their point of view and begin to teach prevention. Obviously, they must continue to teach their specialty—i.e., curative medicine and surgery. It is a matter of common knowledge that there are notable exceptional instances where a medical school is fortunate in possessing an eminent clinical teacher who is also an enthusiast in prevention, but such rare cases do not affect the general position.

The general practitioner is the main product of the medical schools, and if he is to take any important part in the prevention of disease in the future he must be taught prevention systematically and thoroughly as a student as part of an organised course in State and preventive medicine. His point of view needs to be altered, for instead of viewing the diseased portion of humanity as his special and only province, he should be expected to regard disease as something which ought to, and often could be, avoided. Such an altered point of view is not likley to be achieved without considerable innovations into the curriculum. A system which has for generations concentrated on the later stages is not likely, as the result of some small change in, or addition to a lecture syllabus, to pay sufficient attention to the investigation of predisposing conditions and the earliest stages of disease. In the interest of efficient teaching, in fact, it is necessary for each part of the instruction to be in the hands of experts—clinicians to teach diagnosis and treatment, together with investigations in those subjects, with experts in preventive medicine in charge of prevention and investigation into the factors leading to disease.

Teaching in Public Health.

All criticism and suggestions must be based upon facts concerning the present position in the medical schools of the country, and the following tabular statement has been prepared from returns made by the teachers concerned.

At St. Bartholomew's Hospital Medical College the combination of the course in public health with the course in forensic medicine under one lecturer enables the two to be dealt with as a course in "State and Preventive Medicine" occupying 30 lectures, and this arrangement has much to recommend it.

The table below shows that in the London Medical Schools the subject of public health and preventive medicine is officially allocated 12 hours of the medical curriculum. Assuming that the full medical curriculum occupies 4000 hours, the proportion occupied by public health is 0·3 per cent. In the English universities generally the attention given is substantially more, amounting to 30 hours, or 0·8 per cent., while in the Scottish universities the amount of time is almost doubled again, being 55 hours, or 1·4 per cent.

This subject has recently been considered by the American Medical Association in whose model curriculum the subject of public health and preventive medicine receives 3 to 4 per cent. of the entire medical course (roughly, 4000 hours)—i.e., about 140 hours, so that even the Scottish universities have only travelled less than half-way towards the American model.

Hygiene and Public Health—Teaching in Medical Schools.

	Lectures of one hour.	Hours of practical work, demonstrations, &c.
LONDON MEDICAL SCHOOLS:		
Charing Cross Hospital	12	—
Guy's Hospital	12	—
Middlesex Hospital	10	3
St. Bartholomew's	10	—
St. George's	8	—
St. Mary's	10	—
St. Thomas's	12	2
University College	18	—
Westminster	12	—
ENGLISH AND WELSH UNIVERSITIES:		
Birmingham	20	5
Bristol	20	6
Durham	30	10
Leeds	20	8
Liverpool	18	10
Manchester	20	—
Sheffield	20	6
South Wales and Monmouth College	20	6
SCOTTISH UNIVERSITIES:		
Aberdeen	60	10
St. Andrew's	45	5
Edinburgh	30	10
Glasgow	50	5

The most obvious facts which appear to emerge from a consideration of the amount of instruction given to the subject of public health and preventive medicine in the medical schools at the present time are: (1) that a general levelling up in the subject of preventive medicine among the medical schools is necessary; (2) that a greatly improved position should be given to this subject as regards the time allotted to it in the ordinary medical curriculum. The advantages of such alterations would be obvious and immediate. The outstanding gain would be that the practitioner would take his proper place in the preventive system of the country, and he would be inclined to join sympathetically in the health education of the public in health matters, thereby displacing the stunt journalist and the quack from his present position. A matter of secondary advantage would be that the public health post-graduate courses would, moreover, receive a steady supply of qualified men thoroughly conversant with the general principles of public health and preventive medicine, and ready to take full advantage of more advanced teaching and also ready for instruction in practical administration. I propose to refer again to this point at the end of this paper.

Permeation of the Curriculum.

A memorandum on this subject which I prepared some ten years ago for the General Medical Council contains the following paragraph which might be quoted here:—

> It is suggested that the way in which preventive medicine could become a real live subject to the average practitioner is to introduce it properly into the medical curriculum, and the most suitable method, in conformity with modern developments, is by the creation of State Medicine Units in the medical schools. Such a unit would at first consist essentially of one professor only, with a standing similar to the professors of existing units, who would have charge of the teaching in State Medicine and who could act as a kind of "Liaison Officer" to the other parts of the curriculum on the subject of prevention.

The above suggestion is particularly interesting inasmuch as the experiment has since been carried out in the United States of America by the appointment of Prof. W. S. Leathers at the Vanderbilt University, Nashville, whose duty it is not only to carry out instruction in public health and State medicine, but also to secure as far as possible the permeation of the entire medical course with the preventive idea.

The preventive idea should permeate the *beginnings* of the medical curriculum at least as much as it should the later stages, and nothing is more calculated to arouse the interest of the student and to excite his lively attention than references to diseased conditions and their prevention, and the maintenance of health, during the courses in biology, physics, chemistry, physiology, and anatomy. All kinds of prophylactic ideas can be instilled in the mind of the student during his consideration of the chemistry of air and water. During the chemical course also toxicological

matters can be introduced, while convenient opportunities can be taken to illuminate the subject with references to lime absorption by the body, dental hygiene, rickets, composition of foods, food value, and deficiency diseases. In fact, I have no hesitation in saying that, in a properly arranged curriculum, a medical student at the end of his second year ought to know far more about health and prevention of disease than he does about diseased conditions.

In connexion with the courses in anatomy and physiology there should be studied postures and the hygiene of the school classroom, exercises, eye-strain, many of the important points connected with industrial hygiene, hygiene of infancy, and all kinds of dietetic problems.

There is no need to refer to the obvious possibilities of introducing the preventive idea into the courses of bacteriology, pathology, medicine, and surgery. Ideas upon such a subject crowd into the mind which is accustomed to view medicine from the preventive side, but which are not likely to be carried out effectively unless there is in every medical school someone whose duty it is to look after this part of the training.

In an interesting paper published in the *Journal of the American Medical Association* Prof. Leathers discusses the importance of preventive medicine in the curriculum, and states the claim of preventive medicine and public health to be regarded as a major subject and department in the medical school. "There should be," he says, "in every medical school a department of preventive medicine and public health maintaining university standards in scope and ideals. Its scientific and professional status in the medical school will be weighed in comparison with the standards and development of the much older sciences of anatomy, physiology, and pathology, and others of the fundamental science group. With its present difficulties and handicaps it is much more difficult to gain the attention and maintain the consistent and sympathetic interest of the medical student in the hygienic and preventive aspects of medicine than in other branches of the curriculum. To offset this difficulty the place of preventive medicine in the medical school should be more definitely established, the regular and elective courses better defined, proper co-relation effected with clinical teaching, and its work integrated with the health services of the entire University."

At Vanderbilt University the regular course for fourth year medical students consists of 44 lectures and 66 hours of practical work, a total of 110 hours. Interesting interchanges are also arranged between the professors of preventive medicine and bacteriology, whereby the professor in preventive medicine deals with preventive items in the course of bacteriology, while the professor of bacteriology deals with that part of the course in preventive medicine which relates to the bacteriological examination of water and milk. Similarly, interchanges are arranged between preventive medicine and clinical medicine, and the remainder of Prof. Leathers's methods are best described in his own language when he says:—

"In surgery, the control of cancer may be taught in the most graphic way. The prevention of venereal diseases and the social disease problem as a public menace can be discussed in gynæcology, obstetrics, genito-urinary and skin diseases. Child hygiene, including acute infections and problems related to nutrition, could be given special consideration in pediatrics, and maternal care in obstetrics; the prevention of blindness in ophthalmology. In the course of physiology, fatigue could be considered in relation to tuberculosis, and also the problem of nutrition affords a field for study in relation to health and disease."

Prof. Leathers concludes his interesting paper by quoting the impressive words of the late Dr. Sedgwick, who said:—

"The medical school which fails to-day to provide also liberal instruction in preventive medicine, in vital statistics, in sanitary science, in public health laboratory methods, in epidemiology, in preventive sanitation, such as the sanitation of water-supplies and other branches of municipal sanitation; in preventive hygiene, such as mental, social, personal and dental hygiene; and in public health education and public health administration—that medical school is sending out its graduates unprepared for some of the most serious problems they will have to face in the immediate future."

Practical Proposals.

It is encouraging to note that these matters are now beginning to receive serious attention in many quarters. Recently the subject was discussed by the Southern Branch of the Society of Medical Officers of Health with the result that the following resolutions met with unanimous approval:—

1. The present system of medical training in this country is not such as is likely ever to produce in the average medical practitioner any real knowledge of, or liking for, or interest in preventive and State medicine. This lack of adequate instruction, moreover, is likely seriously to prejudice the supply of recruits for the health services of the country.

2. In view of the generally accepted opinion that preventive medicine can attain reasonable effectiveness only when the whole *medical profession* is trained in it, and takes an active part in its practice, and in view also of the fact that the interest of the *public* in preventive medicine has enormously increased recently, and is still increasing, it is desirable that efforts should be made forthwith in order to secure—

(*a*) The establishment in all medical schools of a thorough and comprehensive course in State and preventive medicine as part of the ordinary medical curriculum, and associated with this course as its centre, the comprehensive infiltration of the whole of the medical curriculum with the preventive idea.

(*b*) The requirement by the General Medical Council of proof of adequate instruction in preventive medicine before any candidate can proceed to any qualifying examination for a degree or diploma, and the requirement also by the G.M.C. of a special and adequate examination in this subject as part of all such qualifying examinations.

Much could be accomplished with the sympathetic coöperation of the examining bodies. At present the broad subject of preventive medicine is almost non-existent from an examination point of view, and the subject of public health receives but scant attention. The qualifying bodies in London do not treat it seriously, although the Society of Apothecaries grants it a share of a paper with forensic medicine, while London University gives it a half paper, and a viva voce examination shared also with medical jurisprudence. Similarly, the Scottish Conjoint Board and some of the English universities grant a half paper to the subject, but in the Scottish universities and some English ones it is raised to the dignity of a whole paper and a separate viva voce examination; in others it is combined with medicine. There is a clear case for levelling up and standardisation.

An Omen from America.

Under the English system the public health service can only be entered through ordinary medicine. In other words, the medical officer of health has, first of all, to become a fully qualified practitioner and then he has to specialise in public health in the form of post-graduate study. The advantages of this principle are, of course, obvious and need not be enlarged upon, but the fact remains that at present the number of entries into the public health training schools is at an alarmingly low ebb. It is therefore becoming increasingly obvious that in the public interest the medical student should have his interest stimulated in public health and preventive medicine and its ideals.

In America they appear to be trying an interesting experiment but one which has certain obvious dangers. Special schools of public health have been established which, although they include a large amount of ordinary medical curriculum, do not train students for a full medical qualification but award them, directly, a public health diploma which is, I understand, accepted as qualifying for the public health service.

I understand that the essential reason which led to this step—in my opinion, a very regrettable one—was that the number of men entering the public health service was insufficiently large, and a short cut, therefore, was devised owing to public demand. It is rather astonishing that the well-known business ability of the Americans did not try a more obvious expedient—i.e., making the public health service more attractive financially. I have been dismayed recently by certain figures which have been given me with regard to the remuneration of public health officers in the United States of America, and if these may be taken as representative of the whole service, then I am not at all surprised to hear that the number of well-qualified entrants is deplorably small.

The absolute necessity for the public health officer to be a completely qualified and even an unusually well-qualified man in general medicine and surgery is, I think, obvious to most of us. A public health officer can never be completely effective in his work unless his standing in the profession is such as will inspire respect from his professional brethren.

RESTRICTION OF LOCAL PRACTICE TO HOSPITAL Ex-R.M.O.'s.

THE medical staff of a provincial voluntary hospital asked the hospital committee to insert a clause in the conditions of appointment of the resident medical or surgical officer to the effect that he should not practise within a radius of ten miles for a period of three years after the termination of his appointment. The committee referred the matter to the Central Bureau of Hospital Information which sent out a questionaire to 54 hospitals, inquiring what was their attitude to the enforcement of such a restriction. At some of these hospitals there is one resident medical officer only; the remainder are larger hospitals, situated in industrial areas, county towns, and seaports, each with several resident medical officers.

Fifty-two replies were received, from which it appeared that in 44 (85 per cent.) of the hospitals there is no such restrictive clause in force or in contemplation. In one hospital of over 200 beds in an industrial town of over 100,000 population, there is no restriction at present, but the committee is considering making such a condition; it is stated that almost every house surgeon that has been at the

hospital for the last six or seven years has afterwards settled down to practise in the town. Restrictions against practising in the hospital area are made when appointing resident medical officers at 7 out of the 52 hospitals, as follows:—

Hospital.	Number of beds.	Population of town.	Restriction against practising in the hospital area.	
			Not to practise within:	Period.
A	103	19,000	5 miles	6 months
B	96	62,000	10 ,,	5 years
C	95	46,000	5 ,,	5 ,,
D	62	26,000	5 ,,	5 ,,
E	58	37,000	5 ,,	3 ,,
F	56	23,000	10 ,,	3 ,,
G	45	40,000	2 ,,	Not stated

In the case of hospital G, the restriction is conditional, as follows: "Unless he shall have previously served as resident medical officer at the hospital for a period of not less than five years to the satisfaction of the Committee."

The following observations are extracted from the replies received from the hospitals where there is no such restriction.

(*a*) "Four house surgeons on leaving the hospital have set up for themselves here during the last 25 years."
(*b*) "In the past, many of our residents have practised in the neighbourhood and on many occasions have eventually become members of our honorary staff."
(*c*) "I have never heard of such a proposition and I consider it most unjust and think that such a step should be defeated, no matter who the medical staff are."
(*d*) "There are now three of our former house surgeons practising in our district and in each case they have gone into partnership with local practitioners."
(*e*) "No such clause exists in our appointments, and further, the committee does not agree that such a clause should be entertained."

The result of the inquiry appears as Memorandum No. 5 appended to the tenth annual report (for the year 1928) of the voluntary hospitals in Great Britain (excluding London), published by the Central Bureau of Hospital Organisation, 19, Berkeley-street, London, W.1.

NEW NURSERY FOODS.

WE have received from the firm of Bickiepegs, Ltd., Welwyn Garden City, Herts, samples of three food preparations designed for the use of quite small children. The manufacturers inform us that they have been stimulated to produce these preparations by the writings of Dr. Harry Campbell and others who have laid stress in the medical press or at medical gatherings upon the value of proper mastication in the plastic formation of the tiny jaw and, thus, in the prevention of crowded teeth. The preparations consist of a vegetable broth to which veal bone-marrow has been added; some rusks of twice-baked bread, to which the name of "Chu-Chus" has been given; and some tiny little biscuits, "Bickiepegs," designed to meet a baby's need or desire, at the commencement of dentition, of something to bite upon. These minute biscuits are meant to take the place of the baby's fist, the corner of a shawl, or, indeed, any object to which a crawling baby can get access. These biscuits may well have a real use in assisting the proper eruption of the embedded teeth, where, unfortunately, an artificially nursed baby does not obtain the natural exercise afforded by breast feeding. The preparations have been produced under the direction of two well-known physicians, and the claims of good results that are made by the manufacturers would seem to rest on a sound basis.

SOME TRAVELS OF A VICTORIAN BIOLOGIST.

THE late William Bateson, F.R.S., at the time a young man of 25 years of age, spent the years 1886-87 in biological research work in the Steppe. This was before there were any railway facilities in those parts and the author covered a large area of western Asia on horseback. His travels led him from the Aral Sea to Lake Balkhash, up the river Irtish to Omsk, and then westwards to Orenburg, due north of the Caspian Sea. Those who wish to know of the scientific results of the journey will find them recorded in papers in the Philosophical Transactions of the Royal Society. The letters that form the basis of the present volume[1] are those written to his mother and sisters at home, and were discovered after his mother's death in 1918, packed away in a trunk with other papers according to the fashion of hoarding correspondence which was a feature of the Victorian age useful to posterity. History repeats itself, for the author had trouble with the customs over the admission of scientific instruments into Russia. He gives a lurid picture of the art of packing a tarantass, which structure would appear to deserve his condemnation as one of the most unsatisfactory forms of carriage in existence. During his travels the natives were uniformly kind, though verminous, and the sole troubles that he had were with the authorities. At the start, in Petersburg, everyone was dilatory; he never got an opportunity of delivering a letter of introduction to a serenity, the Russian footman informing him that H.S.H. was not at home in a manner worthy of Jenkins Gruffanuff himself. His diet was that of the locality largely, and one would imagine that he never wished to taste mutton again. Some details of medical interest find a place among the letters; the results of small-pox were evident in many villages, skin diseases were common, as were ophthalmia and blindness. His servants were troublesome in the first year and unusually incompetent in the second. He suffered from diarrhoea and from a nasal discharge, acquired some veterinary skill in the treatment of sore backs, and did a great deal of temporary good to the villagers with a lotion of zinc sulphate. The book contains a couple of maps to illustrate the author's wanderings and a number of amusing drawings are printed in the margins of some of the earlier letters.

[1] Letters from the Steppe. By William Bateson. Edited, with an introduction, by Beatrice Bateson. London: Methuen and Co. Pp. 222. 7*s*. 6*d*.

COD-LIVER OIL CREAM.

OUR attention has been called to a cod-liver oil preparation made by Mr. R. Thomson, of Abbey-street, Elgin, Scotland, which has been highly commended by members of the medical profession who have used it. The emulsion is perfect and contains fresh eggs, 50 per cent. of a high grade cod-liver oil, and is newly prepared every week. In appearance it resembles dainty cream, is easy to take, and causes no unpleasant after-effects, while it is free from emulsifying agents which might affect the contents. We can recommend the preparation.

AN EXPERIMENT IN STERILISATION OF THE UNFIT.

THE State of California has been carrying out, during the last twenty years, a vast eugenic experiment on the results of sterilisation of the mentally defective and unfit. We referred to the outstanding results of these investigations in our issue of May 14th.[1] In a little book[2] recently published, the gist of the pamphlets and papers scattered in various journals on this subject has been gathered together by Mr. E. S. Gosney, the philanthropist who has financed the inquiry, and Mr. Paul Popenoe, D.Sc., one of the leading eugenists concerned in it. The authors are convinced of the practicability and value of sterilisation under adequate safeguards, and their book is, of course, a piece of special pleading. It contains, however, many incontrovertible facts and should be read by everybody who is concerned at the alarming increase of mental deficiency in our country. The book goes to show that, in California at any rate, it is possible to sterilise large numbers of defective boys and girls without any appreciable risk to life, without any decrease in their happiness or usefulness, and without any of the alarming social consequences that are often threatened by the opponents of sterilisation. Appendices to the book contain a bibliography, an article by DR. R. L. DICKENSON on the surgery of sterilisation, a review of the sterilisation laws of the various States, the sterilisation figures in the various American institutions up to Jan. 1st of last year, and a review of a Roman Catholic discussion of the subject by Dr. Joseph Mayer. The book is published by the Human Betterment Foundation, a trust founded by Mr. Gosney in 1928 to perpetuate the work summarised in this volume and to endow similar social measures.

[1] THE LANCET, 1929, i., 924 and 935.

[2] Sterilisation for Human Betterment. By E. S. Gosney, B.S., LL.B., and Paul Popenoe, D.Sc. London: Macmillan and Co., Ltd. 1929. Pp. 202. 8*s*. 6*d*.

THE KOMFORT CORK SEAT.

WE have received from Messrs. William Brookes and Co., sanitary seat-makers, 2, Royle-street, Oldham-road, Manchester, and 30, Langdale-avenue, Levenshulme, Manchester, a sample of a lavatory seat made of cork, stained, and covered with a varnish which is impermeable to fluids, so ensuring cleanliness. The seat has a low conductivity for heat and should therefore be comfortable for users who are sick.

A DISCLAIMER.

To the Editor of THE LANCET.

SIR,—I should like it to be known that I had no knowledge of or participation in the notice of our work at the Bristol Royal Infirmary which has appeared in a lay journal.

I am, Sir, yours faithfully,

Bristol, Dec. 30th, 1929. A. T. TODD.